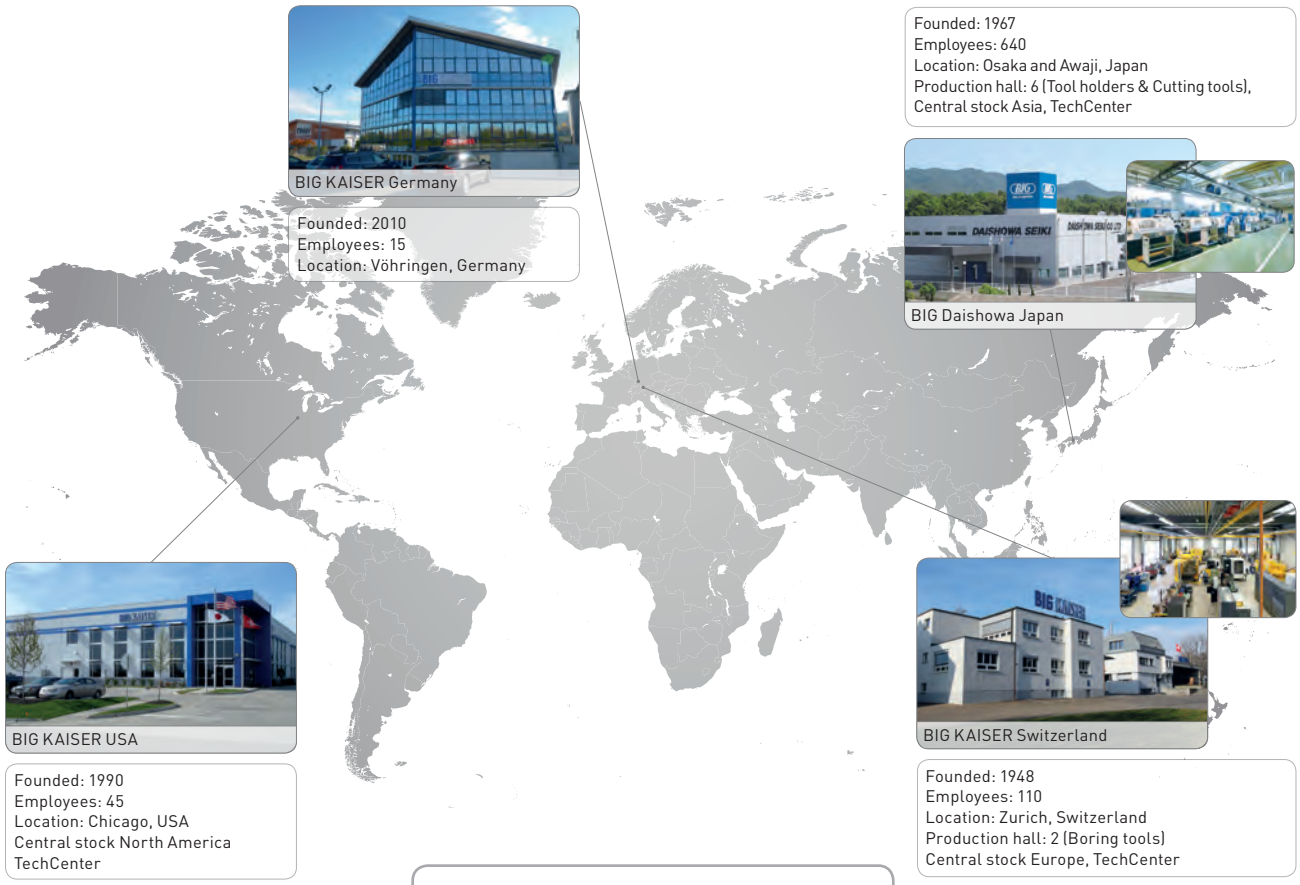
BIG KAISER

CUTTING DATA TABLES

For fine- and rough boring heads of BIG KAISER

BIG KAISER – the key to higher performance

Since 1948 BIG KAISER manufactures high performance tooling solutions for the metal cutting industry. The products are developed to meet the highest standards and are fully produced in Switzerland and Japan. As part of the family owned BIG DAISHOWA Group with more than 800 employees, BIG KAISER has corporate headquarters in Switzerland, Germany and the United States.



BIG KAISER

INNOVATION
Investment of 10% of sales in development and infrastructure

PRODUCTIVITY
500 000 produced collets per year and 320t processed steel per year

GLOBAL
BIG KAISER has more than 200 sales reps and partners

KNOW-HOW
Founded in 1948

QUALITY AND PRECISION
Accuracy of Ø 1 µm

FLEXIBILITY
Batch size 1 – 10 0000 as 20 000 standard products and 1 200 special tools

PERFORMANCE
Production area size of 135 000m²

SERVICE
Stock levels at 95%

CONTENTS

GENERAL INFORMATION

CUTTING DATA

On the following pages, tables with recommended speeds and feeds are provided. The values in these tables are the result of practical experience and specific tests. They serve as guidelines to help operators use BIG KAISER boring tools efficiently.

For tools in the diameter range from 15 to 340 / 620 mm, there are different tables for the tool shank sizes DV40, BT40, HSK-A63, Capto C6 and DV50, BT50, HSK-A100, Capto C8. The tool shanks and the machines on which these tools are used, have a decisive influence on the rigidity and available drive power, which are especially important for heavy rough boring operations.

In the smaller diameter range from 0.4 – 50 mm, there are different tables for the different sizes of the fine boring heads, with their specific accessories, such as tool holders and boring cutters.

Every table has its specific colour. See table of contents.

A Cutting Data App for Smart Phones and Tablets

BIG KAISER has developed a smartphone and tablet app to enhance the user-experience when assembling and running cutting tools while providing extremely precise cutting data. This app will help operators fine tune the optimal cutting parameters for their tool assemblies. They can save their tool adjustment history in the app for future reference; this is an essential "piece-of-the-puzzle" for shops joining the smart manufacturing movement. 61 BIG KAISER boring heads, covering diameters from Ø.01575" (Ø 0.4 mm) up to Ø24.41" (Ø 620 mm), are currently supported by this app. Cutting data for rough and fine boring tools is available in both metric and imperial units.

The key benefit that this app brings the user is that machine and tool data, parameters and settings are always available and can be monitored remotely in real-time. Comprehensive information is displayed on a large legible screen, providing greater comfort than the existing on-machine interface. More precise information should lead to improved decision-making, thereby contributing to the bottom line.

To the App

Convenience at Your Fingertips!

- Cutting data calculator
- Calculator for adjusting tools
- Quick access to operating manuals
- Tool overview
- Application data
- Store favorites
- Tool Tips
- Metric and imperial units available

Insert Development

The customer shall reach the best possible results in terms of performance, precision and cost efficiency for all boring operations with BIG KAISER twin cutter and precision boring tools. Therefore, not only outstanding boring tools are required, but also inserts, specially designed for boring, which fulfil the highest demands.
BIG KAISER invests continuously in development and tests of new inserts. New geometries will be defined, coatings tested and different substrates evaluated, often also in co-operation with carbide- and coolant manufacturers.

Criteria	Workpiece Material	Machining Process	Cutting Condition
To be considered	Material group Crystalline structure	Rough boring Fine boring Bore diameter Depth of cut (ap)	Interrupted cut Continuous cut Depth of cut Precision HSC Workpiece chucking Rigidity of tool
With effect on	Substrate of cutting material Coating	Shape of insert Size of insert	Cutting edge geometry Nose radius Rake and relief angle Chip breaker ground or sintered Circumference ground or sintered
Target	**Indexable inserts for perfect chip control, maximum tool life and minimized costs**		

«The selection of the indexable insert is decisive for the machining process and reduces production costs.»

Ralph Stadelmann,
Head of Special Tooling & Testing BIG KAISER

The results of the developments and tests are shown in the BIG KAISER cutting data table. In their, you'll find the most suitable inserts for the variety of workpiece materials and machining processes in relation to the tool configuration. The table shows precise cutting data for all applications.

Spindle speed

$$n = \frac{1000 \times V_c}{D_c \times \pi} \quad (min^{-1})$$

Cutting speed

$$V_c = \frac{n \times D_c \times \pi}{1000} \quad (m/min)$$

Feed per min.

$$V_f = f_n \times n \quad (mm/min)$$

Feed per revolution

$$f_n = f_z \times Z \quad (mm)$$

Cross section of chip

$$A = ap \times f_n \quad (mm^2)$$

Material removal rate (Boring)

$$Q = A \times V_c \quad (cm^3/min)$$

Cutting performance (Boring)

$$P = \frac{ap \times f_n \times V_c \times k_c}{1000 \times 60} \quad (kW)$$

Torque (Boring)

$$M_c = \frac{(D_c^2 - D_i^2) \times f_n \times k_c}{8000} \quad (Nm)$$

Specific cutting force

$$k_c = \frac{k_c1.1}{h^{m_c}} \quad (N/mm^2)$$

Thickness of chip

$$h = f_z \times \sin\kappa \quad (mm)$$

With an entering angle of 90° the chip thickness is equal to the feed per tooth (f_z).

Material removal rate (Drilling)

$$Q = \frac{V_f \times \pi \times D_c^2}{4 \times 1000} \quad (cm^3/min)$$

Cutting performance (Drilling)

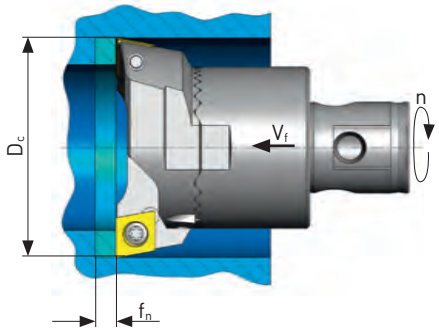
$$P = \frac{M_c \times 2 \times \pi \times n}{60 \times 1000} \quad (kW)$$

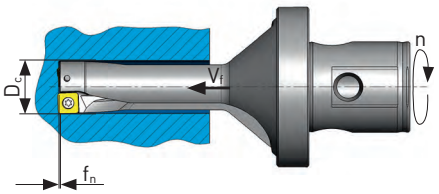
Feed force (Drilling)

$$F_f = \frac{0.63 \times f_n \times D_c \times k_c}{2} \quad (N)$$

Torque (Drilling)

$$M_c = \frac{D_c^2 \times k_c \times f_n}{8000} \quad (Nm)$$





Conversion table Metric/Inch

Length dimensions

$$\text{mm to Inch} = \frac{mm}{25.4}$$

$$\text{m to feet} = \frac{m}{0.3048}$$

Cutting speed

m/min to SFM = m/min x 3.28

$$RPM = \frac{SFM \times 3.82}{D}$$

Feed

$$\text{mm/rev to Inch/rev} = \frac{mm/rev}{25.4}$$

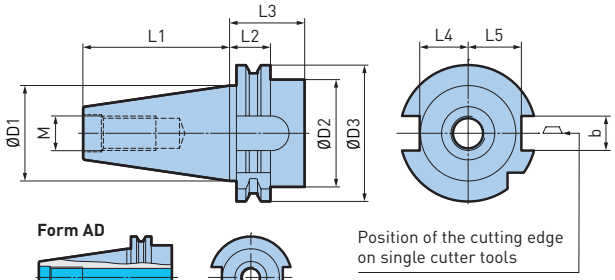
IPM = RPM x IPR

Workpiece material	Workpiece material No.	$k_c1.1$ (N/mm²)	m_c
St 37-2	1.0037	1780	0.17
St 50-2	1.0050	1990	0.26
CK 45	1.1191	2220	0.14
40CrMnMo S 8 6	1.2312	1800	0.27
X5CrNi 18 10	1.4301	2350	0.21
X5CrNiMo17 12 2	1.4401	2600	0.19
GG 20		1020	0.25
GGG 40		1005	0.25
GGG 80		1130	0.44
AL Wrought alloys	3.3535	780	0.23
AL Cast alloys	3.2581	830	0.23
TiAl 6V4	3.7164	1370	0.21

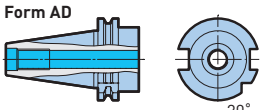
A	Cross section of chip	mm²
ap	Depth of cut	mm
D_c	Cutting diameter	mm
D_i	Diameter of starting bore	mm
F_f	Feed force	N
f_n	Feed per revolution	mm
f_z	Feed per tooth	mm
h	Thickness of chip	mm
k_c	Specific cutting force	N/mm²
$k_c1.1$	Specific cutting force for a chip cross section of 1mm² and chip thickness h = 1mm	N/mm²
m_c	Increase of the k_c curve	
M_c	Torque	Nm
n	Spindle speed	min⁻¹
P	Cutting performance	kW
Q	Material removal rate	cm³/min
V_c	Cutting speed	m/min
V_f	Feed per min.	mm/min
Z	Number of teeth	

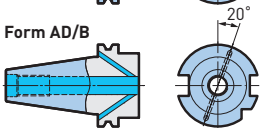
Steep taper shanks DIN 69871 / DV

DV	30	40	45	50
ØD1	31.75	44.45	57.15	69.85
ØD2 max.	45	50	63	80
ØD3	50	63.55	82.55	97.5
L1	47.8	68.4	82.7	101.75
L2	19.1	19.1	19.1	19.1
L3 min.	35	35	35	35
L4	16.4	22.8	29.1	35.5
L5	19	25	31.3	37.7
b	16.1	16.1	19.3	25.7
M	M12	M16	M20	M24



Position of the cutting edge on single cutter tools

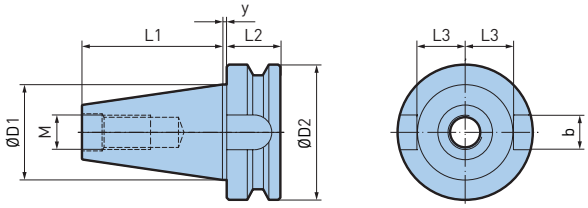


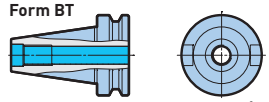


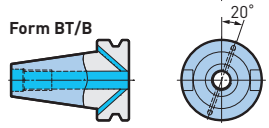
Centre and flange through coolant

Steep taper shanks JIS B6339/BT

BT	30	40	45	50
ØD1	31.75	44.45	57.15	69.85
ØD2	46	63	85	100
y	2	2	3	3
L1	48.4	65.4	82.8	101.8
L2	20	25	30	35
L3	16.3	22.6	29.1	35.4
b	16.1	16.1	19.3	25.7
M	M12	M16	M20	M24



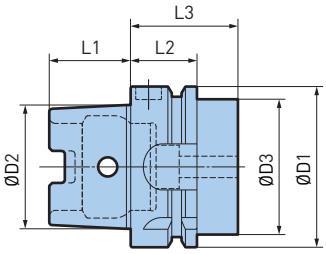


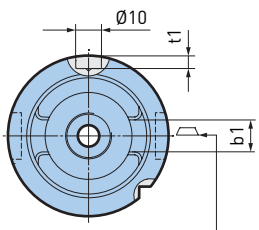


Centre and flange through coolant

Hollow taper interface DIN 69893, form A

HSK-A	32	40	50	63	80	100
ØD1	32	40	50	63	80	100
ØD2	24.007	30.007	38.009	48.010	60.012	75.013
ØD3 max.	26	34	42	53	68	88
L1	16	20	25	32	40	50
L2	20	20	26	26	26	29
L3 min.	35	35	42	42	42	45
b1	7.05	8.05	10.54	12.54	16.04	20.02
t1	5.4	5.2	5.1	5.0	4.9	4.9

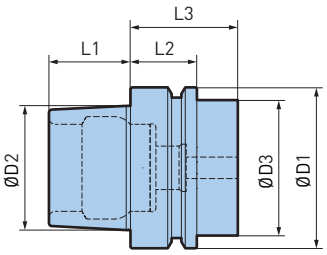


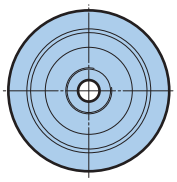


Position of the cutting edge on single cutter tools

Hollow taper interface DIN 69893, form E

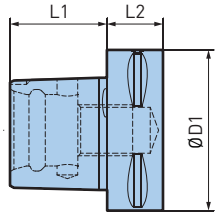
HSK-E	25	32	40	50	63
ØD1	25	32	40	50	63
ØD2	19.006	24.007	30.007	38.009	48.010
ØD3 max.	20	26	34	42	53
L1	13	16	20	25	32
L2	10	20	20	26	26
L3 min.	20	35	35	42	42

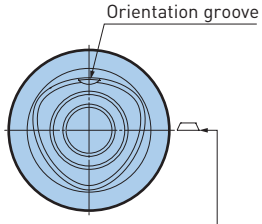




BIG CAPTO (compatible with ISO 26623-1, polygonal hollow shank taper with face contact)

C	4	5	6	8
ØD1	40	50	63	80
L1	24	30	38	48
L2	20	20	22	30



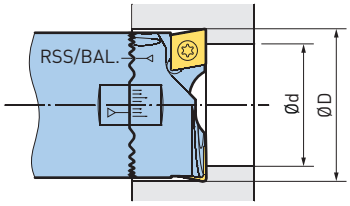


Position of the cutting edge on single cutting tools

Rough boring methods

1. RSS Rotationally symmetrical rough boring

The symmetrical cutter arrangement is the most used adjustment for twin cutter heads. Especially suitable for small to medium stock removal (up to 10% of the final bore diameter) with high feed rates.

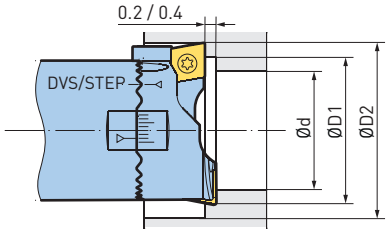


Examples
(Insert holders type CC, SC, SD and WC)

Boring head	Ød	ØD
SW / 32	38	42
SW / 41	45	50
SW / 68	90	100

2. DVS Double offset rough boring

Diameter and height offset cutters allow the removal of twice the stock (20% of the final bore diameter), with half the feed rate and excellent chip control.

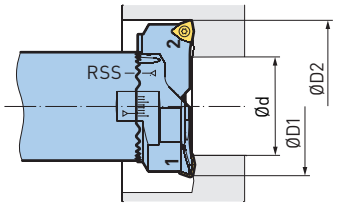


Examples (Insert holders type CC)

Boring head	Ød	ØD1	ØD2
SW 25	28	31.5	35
SW 53	60	67.5	75
SW 100	110	125	140
SW 100			

3. VPS Full profile rough boring

Heavily offset cutter arrangement in diameter for largest stock removal (up to 40 % of the final diameter), with surprisingly low power requirement. Due to the use of inserts type WC, the boring head functions like an adjustable insert drill for rough boring.



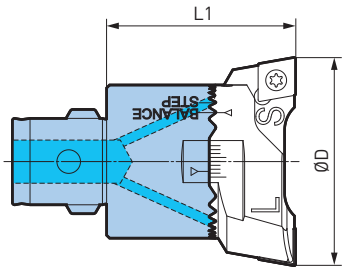
Examples (Insert holders type CC)

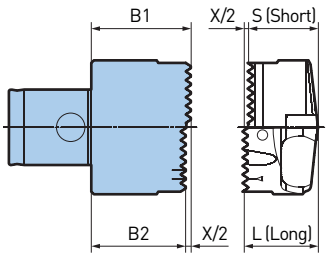
Boring head	Ød	ØD1	ØD2
SW / 41	38	52	62
SW / 53	45	63	75
SW / 68	67	90	110

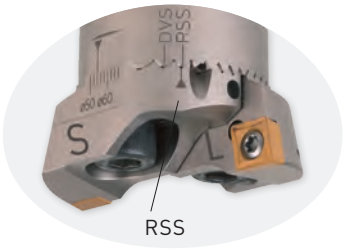
Adjustment instructions for rough boring heads SW

Rotationally symmetrical rough boring

Both cutting edges are adjusted to the same length and to the same diameter. Mount the long insert holder "L" on the short support "B2" of the tool body and the short insert holder to the long support "B1". The reference line marking on both insert holders is aligned to the RSS markings on the tool body.

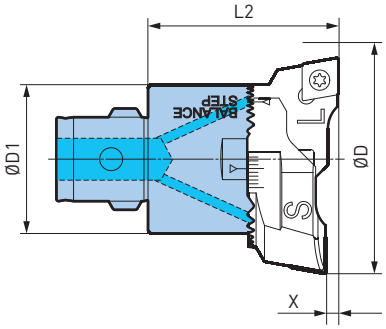


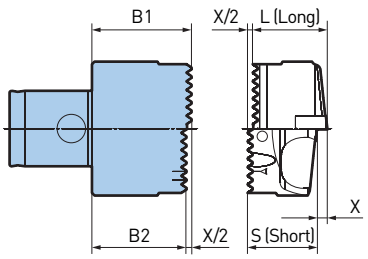


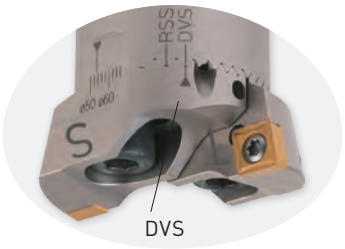


Double offset rough boring

The cutting edges are displaced in length and diameter. The difference in length is achieved by mounting the insert holders in a 180° twisted position. The reference line marking on both insert holders is aligned to the DVS markings on the tool body. Adjust the cutting edge on insert holder "L" to half the stock allowance. (Pre-cutter)







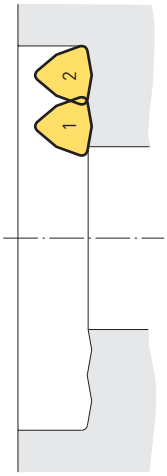
Full profile rough boring – Application and adjustment instructions

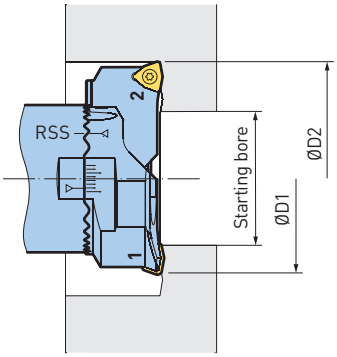
Full profile rough boring permits rough boring with large stock allowances (30 mm and more in diameter) in a single operation, with relatively low drive consumption.

Adjustment instructions for insert holders type WC:

- Mount the insert holders on mark "RSS".
- Set cutting edge 2 to the final bore diameter (D2).
- Set cutting edge 1 corresponding to the starting bore diameter, according to the table (column D1).
- Both cutting edges must be located at exactly the same height. Use coolant in large quantities.

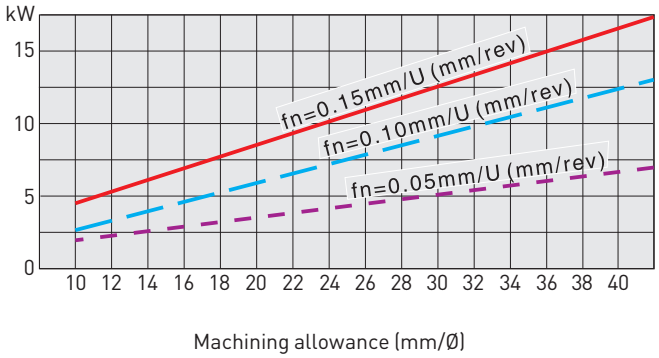
Table for optimum cut sharing in full profile rough boring operations VPS





For Boring Head	Insert Holder Order No.	Starting Bore Ø	ØD1	ØD2
SW41	639.243	35 - 37.9	49	51 - 62
		38 - 41	52	54 - 62
SW53	639.253	41 - 44.9	59	61 - 76
		45 - 50	63	65 - 76
	639.257	51 - 54.9	69	76 - 86
		55 - 60	73	81 - 86
SW68	639.263	50 - 55.9	73	75 - 93
		56 - 61.9	79	81 - 93
		62 - 67	85	87 - 93
	639.267	67 - 72.9	90	92 - 110
		73 - 78.9	96	98 - 110
		79 - 85	102	104 - 110
SW98	639.273	84 - 89.9	107	109 - 129
		90 - 95.9	113	115 - 133
		96 - 102.9	119	121 - 133
		103 - 109	126	128 - 133
	639.277	108 - 114.9	131	133 - 154
		115 - 121.9	138	140 - 159
		122 - 128.9	145	147 - 159
		129 - 135	152	154 - 159
SW148	639.283	134 - 139.9	157	159 - 179
		140 - 145.9	163	165 - 183
		146 - 152.9	169	171 - 183
		153 - 159	176	178 - 183
	639.287	158 - 164.9	181	183 - 204
		165 - 171.9	188	190 - 209
		172 - 178.9	195	197 - 209
		179 - 185	202	204 - 209

Driving power



Machining allowance (mm/Ø)

Vc = 100 m/min
Material: St 60, Kc1 = 2110 N/mm²
Efficiency η = 0.8

Cutting data-guide values

Cutting speed: Vc = 100 - 200 m/min
Feed: fn = 0.05 - 0.15 mm/U

Fine boring methods

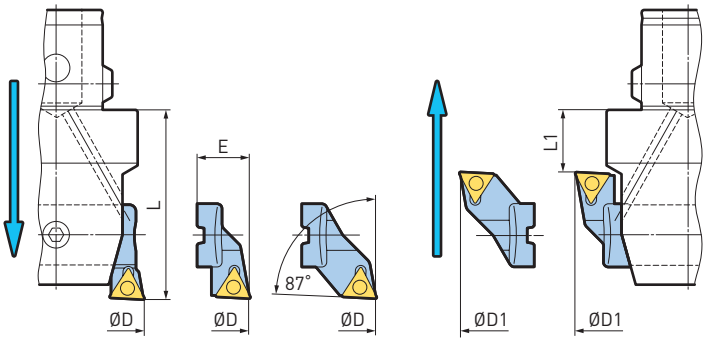
There are two different methods of precision boring, machining with the fine boring cycle and machining with the reaming cycle. Both methods have advantages:

Fine boring cycle (G 76)
boring – spindle stop – spindle orientation – displacement – retraction
This cycle is used for:
- deep bores with long tools
- low cutting speeds and low rpm
- large boring diameter > 200 mm Ø
- problems with tool life and surface quality

Reaming cycle (G 85)
Forward – backward boring
This cycle is used for:
- short bores
- small diameters
- high cutting speeds and high rpm
- tight form and position tolerances

Extension of the boring range

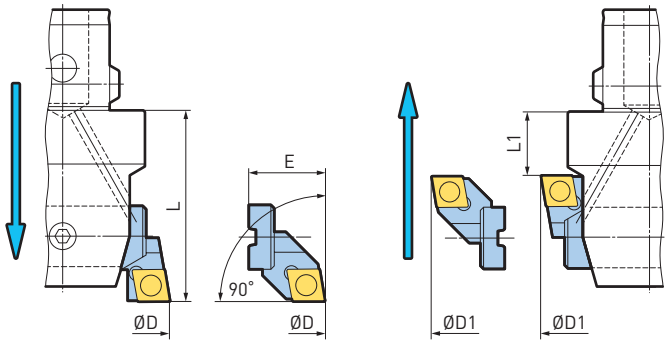
Insert holder type E, with 87° approach angle
For each one of the fine boring heads EWN 20 - EWN 100 and EWE 41 - EWE 100 there are two additional insert holders (size 2 and size 3) available for the extension of the boring range and for back boring. The boring range from Ø20 - 153 mm is covered with insert holder size 1 of each boring head.



Size 1 Size 2 Size 3 Size 3 Size 2

Insert holder Type C, with 90° approach angle
For each of the fine boring heads EWN 25 - EWN 100 and EWE 41 - EWE 100, there are two insert holders with 90° approach angle available.

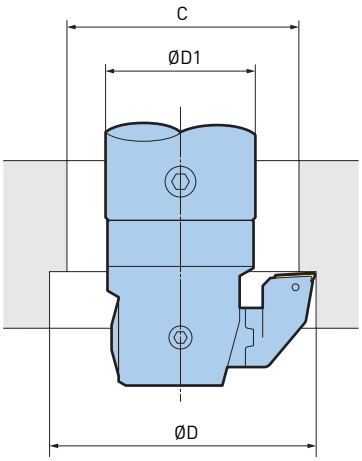
The cutting data given in the tables is valid for the insert holders type E and type C as well as for forward and back boring.



Size 2 Size 3 Size 3 Size 2

Back boring
For back boring, it is required to enter into the bore off centre, with a tool adjusted to the back bore diameter. In this respect, the back bore diameter "ØD" as well as the diameters of the entry bore "C" and the tool body "A", are related to each other. These values can be calculated as follows:

Caution:
- Counter clockwise spindle rotation is required for back boring operations.
- The cutting edge is at a shorter length than the boring head. Consider total length of tool. Check the space at the back side of the workpiece.



Min. entry bore diameter "C"

$$C = \frac{ØD + ØD1}{2}$$

Max. back bore diameter "ØD"

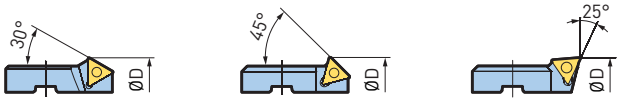
ØD = 2C - ØD1

Max. tool body diameter "A"

ØD1 = 2C - ØD

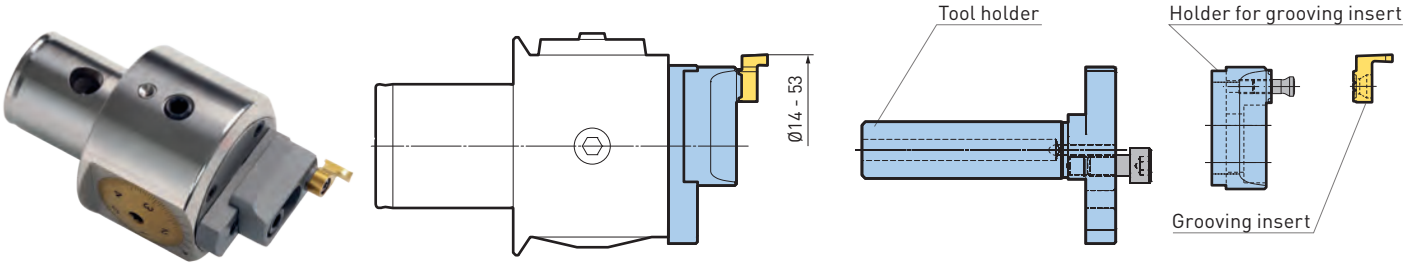
Chamfering and recessing

Special insert holders for chamfering 30° and 45° as well as for recessing in stepped bores.

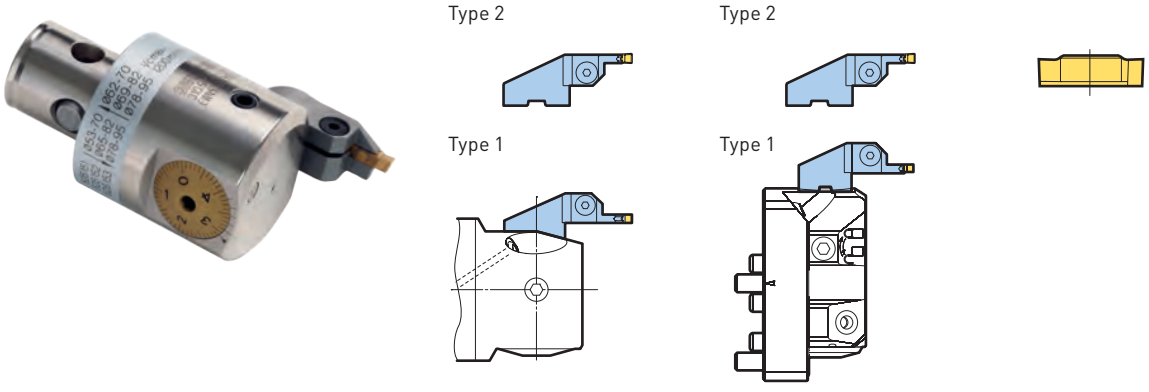


Face grooving Ø 14 - Ø 3040 mm

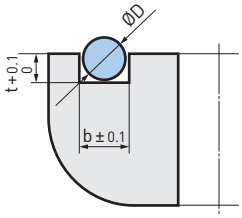
Face groving Ø 14 - 53 mm
With EWN/EWE 2-152, series 112 and special tool and insert holder,
groove width 2 – 3 mm, groove depth max. 5 mm



Face grooving Ø 53 - 3040 mm
With EWN/EWE 53, 68. 100, series 310 and EWN/EWE 200, series 318 and with special insert holders,
groove width 2.5 – 4 mm, groove depth 2.7 – 4.3 mm



Groove dimensions
Recommended groove dimensions for given cross section diameters of O-rings, for static sealing.



ØD	Groove Width b	Groove Depth t
1.78	2.5	1.3
2.0	2.5	1.6
2.5	3.3	1.9
2.62	3.5	2.05
3.0	4.0	2.4

Cutting data
The given data are guide values and have to be adjusted according to the actual working conditions.

Workpiece Material	Vc m/min	fn mm/rev
Construction- heat treatable steels	120 - 200	0.01 - 0.03
Stainless steels	60 - 120	0.01 - 0.02
Cast iron	80 - 160	0.02 - 0.04
Aluminium	200 - 400	0.02 - 0.04
Non-ferrous metals		

Cutting data for indexable insert drills serie 337
3xD and 4xD, Ø 16-30 mm

Designation	No.	Cutting speed Vc (m/min) [1] Coolant from outside 3xD / 4xD	Cutting speed Vc (m/min) [1] Coolant trough the drill 3xD	Cutting speed Vc (m/min) [1] Coolant trough the drill 4xD	Feed fn (mm/U) Drill Ø 16-20	Feed fn (mm/U) Drill Ø 21-30
St 37	(1.0067)	160 - 200	240 - 280	200 - 240	0.08	0.10
St 60	(1.0062)	140 - 160	220 - 280	180 - 220	0.08	0.10
CK 45	(1.1191)	140 - 160	220 - 280	180 - 220	0.08	0.10
34CrMo4	(1.7220)	120 - 160	180 - 220	160 - 200	0.08	0.10
40CrMnMo7	(1.2311)	100 - 140	160 - 200	140 - 180	0.06	0.08
X210Cr12	(1.2080)	100 - 140	160 - 200	140 - 180	0.05	0.07
X100CrMo13	(1.4108)	100 - 140	160 - 200	140 - 180	0.05	0.07
GG 20 - GG 40		130 - 170	220 - 260	170 - 210	0.10	0.12
GG 60		130 - 170	220 - 260	170 - 210	0.10	0.12
GGG 42		120 - 160	180 - 220	160 - 210	0.08	0.10
Aluminum [2]		200 - 300	250 - 500	250 - 500	0.06	0.08

[1] The above cutting data are guide values and apply under normal working conditions when an ample supply of coolant is used.

[2] Machining of aluminium: In case of unfavourable chipping, interrupt drilling cycle for chip removal.

Max. drilling depth with flood coolant supply: 1xD

Cutting data for indexable insert drills serie 336
2xD and 3xD, Ø 31-74 mm

Designation	No.	Cutting speed Vc (m/min) [1] Coolant from outside	Cutting speed Vc (m/min) [1] Coolant trough the drill	Feed fn (mm/U) Drill 31.0 - 41.9	Feed fn (mm/U) Drill ≥ 42
St 37	(1.0067)	200 - 240	240 - 280	0.10	0.10
St 60	(1.0062)	180 - 220	220 - 280	0.12	0.15
CK 45	(1.1191)	180 - 220	220 - 280	0.12	0.15
34CrMo4	(1.7220)	140 - 180	180 - 220	0.12	0.15
40CrMnMo7	(1.2311)	120 - 160	160 - 200	0.12	0.15
X210Cr12	(1.2080)	120 - 160	160 - 200	0.12	0.15
X100CrMo13	(1.4108)	120 - 160	160 - 200	0.12	0.15
GG 20 - GG 40		150 - 220	220 - 260	0.22	0.25
GG 60		150 - 220	220 - 260	0.22	0.25
GGG 42		140 - 180	180 - 220	0.12	0.15
Aluminum		200 - 300	250 - 500	0.10	0.10

[1] The above cutting data are guide values and apply under normal working conditions when an ample supply of coolant is used.

Max. drilling depth with flood coolant supply: 1xD


L
S
RSS/BALANCE
DVS/STEP
040 050
BIG KAISER
319.401 ZB
SWISS MADE
SW41-66CKB4
BATTERY
CR 1025
1 000

With the exception of the diameter range 15 - 22 mm (page 14/15), which is covered by the fine boring heads EW 15 and EW 18, there is cutting data of one specific diameter range on each double page, which corresponds to the size of the rough- and the fine boring head.
For the diameter range bigger than 200 mm, the data is valid for light weight boring tools series 318.

The diameter ranges shown in the headline of each page will be reached for rough boring with a second pair of insert holders and for fine boring with additional insert holders size 2 and size 3.

The maximum values of the cutting data given in the tables require spindle speed of 12 500 rpm and spindle power of approx. 20 kW. In case of lower available speeds and spindle power, the cutting data has to be adapted accordingly.

The cutting data is valid for rough boring heads type SW, and for the fine boring heads type EWN, EWB/EWB-UP and EWE. The max. permissible cutting speeds to operate these heads are listed below and may not be exceeded at any time:

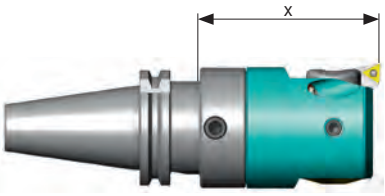
Rough boring heads SW:	1 200 m/min
Fine boring heads EWN/EWE:	1 200 m/min
Balanceable fine boring heads EWB/EWB-UP:	2 000 m/min

In the table the following terms and dimensions are used:

Workpiece material:	Material no. according to DIN or generally used designation	
Boring depth X:	Projection length according to picture 1 and picture 2	
Insert:	Detailed information about the inserts is shown in the BIG KAISER main catalogue.	
R:	Nose radius	(mm)
Vc:	Cutting speed	(m/min)
Stock allow.:	Sock allowance per cut in Ø	(mm)
fn:	Feed per revolution	(mm/U)
Ra:	Surface roughness (Ra 1.6 µm for N7)	
RSS:	Rotationally symmetrical rough boring	page 7
DVS:	Double offset rough boring	page 7
VPS:	Full profile rough boring	page 8

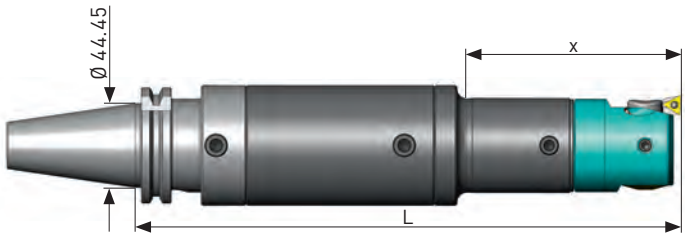
Diameter-length ratio

For long tool assemblies with different boring bar diameters, the boring depth X may not be the decisive factor for the cutting data to be applied, but the total tool length. Should the diameter-length ratio in relation to taper gauge diameter be bigger than 1:6, the lowest cutting data (highest X-value) has to be applied.



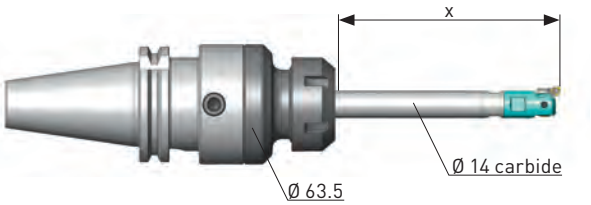
Picture 1

Boring depth X including the useable length of the tool shank and the boring head.

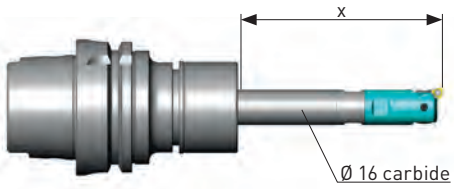


Picture 2

Boring depth X including the useable length of the reduction and the corresponding boring head.



EW 15

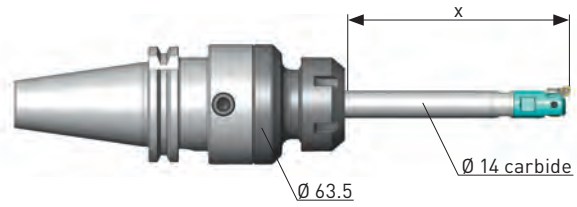


EW 18

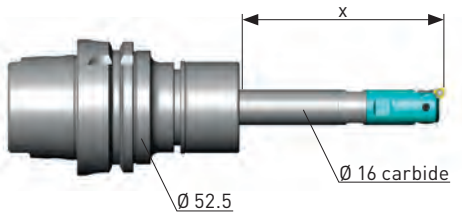
Workpiece material		Boring depth	Fine boring EW 15						Fine boring EW 18					
			Inserts		Vc	Allow.		Feed	Inserts		Vc	Allow.		Feed
						Std. val.	Max.	Ra 1.6 µm				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	50	655.602	0.2	320	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	200	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	150	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	50	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	260	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	190	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	140	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	50	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	250	0.2	0.5	0.06
		60	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	250	0.2	0.5	0.06
		80	655.602	0.2	225	0.2	0.5	0.06	655.602	0.2	225	0.2	0.5	0.06
		100	655.602	0.2	160	0.2	0.5	0.06	655.602	0.2	160	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	120	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	50	655.603	0.2	350	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		60	655.603	0.2	310	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		80	655.603	0.2	240	0.2	0.5	0.06	655.603	0.2	310	0.2	0.5	0.06
		100	655.603	0.2	180	0.2	0.5	0.06	655.603	0.2	240	0.2	0.5	0.06
		120	655.605	0.1	90	0.1	0.3	0.04	655.603	0.2	180	0.2	0.5	0.06
		140	655.605	0.1	40	0.1	0.3	0.04	655.605	0.1	100	0.1	0.3	0.04
		160							655.605	0.1	50	0.1	0.3	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to mount a fine balanced tool shank.



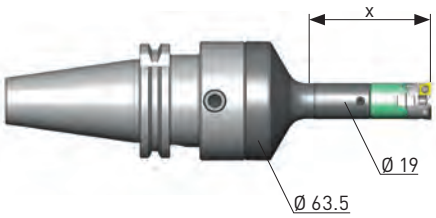
EW 15

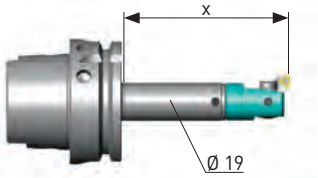


EW 18

Workpiece material		Boring depth	Fine boring EW 15						Fine boring EW 18					
			Inserts		Vc	Allow.		Feed	Inserts		Vc	Allow.		Feed
						Std. val.	Max.	Ra 1.6 µm				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	50	655.603	0.2	350	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		60	655.603	0.2	310	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		80	655.603	0.2	240	0.2	0.5	0.06	655.603	0.2	310	0.2	0.5	0.06
		100	655.603	0.2	180	0.2	0.5	0.06	655.603	0.2	240	0.2	0.5	0.06
		120	655.605	0.1	90	0.1	0.3	0.04	655.603	0.2	180	0.2	0.5	0.06
		140	655.605	0.1	40	0.1	0.3	0.04	655.605	0.1	100	0.1	0.3	0.04
		160							655.605	0.1	50	0.1	0.3	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	50	655.602	0.2	320	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	200	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	150	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	50	655.601	0.2	550	0.2	0.5	0.06	655.601	0.2	700	0.2	0.5	0.06
		60	655.601	0.2	550	0.2	0.5	0.06	655.601	0.2	700	0.2	0.5	0.06
		80	655.601	0.2	400	0.2	0.5	0.06	655.601	0.2	650	0.2	0.5	0.06
		100	655.601	0.2	300	0.2	0.5	0.06	655.601	0.2	500	0.2	0.5	0.06
		120	655.601	0.2	150	0.2	0.3	0.06	655.601	0.2	300	0.2	0.5	0.06
		140	655.604	0.1	70	0.1	0.3	0.04	655.604	0.1	150	0.1	0.3	0.04
		160							655.604	0.1	70	0.1	0.3	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.602	0.2	100	0.2	0.3	0.06	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	50	0.1	0.3	0.04	655.606	0.1	100	0.1	0.3	0.04
		160							655.606	0.1	50	0.1	0.3	0.04
S	Titanium 3.7164	50	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		60	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		80	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		100	655.602	0.2	80	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		120	655.606	0.1	60	0.1	0.3	0.04	655.602	0.2	80	0.2	0.4	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	60	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Ni-basic-, Co-basic-, Alloys	50	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		60	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		80	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		100	655.602	0.2	40	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		120	655.606	0.1	30	0.1	0.2	0.04	655.606	0.1	40	0.1	0.2	0.04
		140							655.606	0.1	30	0.1	0.2	0.04
		160												

Remark:
The boring heads EW 15 and EW 18 will be screwed on carbide shanks 615.233 / 615.221 and 615.268 / 615.227 / 615.269 / 615.229. For chucking the carbide shanks, we recommend BIG MEGA Chuck collet holders.

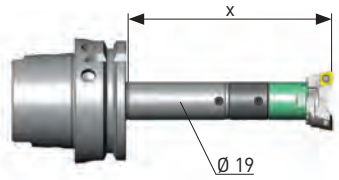


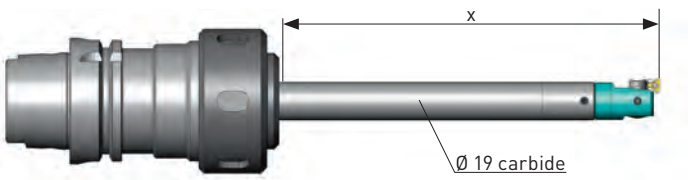


	Workpiece material	Boring depth	Rough boring SW 20							Fine boring EWN 20					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	65	654.850A	0.4	220	3.00	0.35	5.0	0.18	651.713	0.4	400	0.2	1.0	0.10
		85	654.850A	0.4	125	2.00	0.30	4.0	0.15	651.738	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	60	1.50	0.25	3.0	0.12	651.838	0.2	100	0.2	0.7	0.06
		115	654.850A	0.4	220	3.00	0.35	5.0	0.18	651.738	0.3	260	0.2	1.0	0.08
		150	654.840A	0.2	125	2.00	0.30	4.0	0.15	651.838	0.2	130	0.2	1.0	0.06
		175	654.840A	0.2	60	1.50	0.25	3.0	0.12	651.824	0.1	60	0.1	0.5	0.04
		200	654.840A	0.2	25	1.00	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	65	654.850A	0.4	220	3.00	0.30	5.0	0.15	651.713	0.4	400	0.2	1.0	0.10
		85	654.850A	0.4	125	2.00	0.25	4.0	0.12	651.738	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	60	1.50	0.25	3.0	0.12	651.838	0.2	100	0.2	0.7	0.06
		115	654.850A	0.4	220	3.00	0.30	5.0	0.15	651.738	0.3	260	0.2	1.0	0.08
		150	654.840A	0.2	125	2.00	0.25	4.0	0.12	651.838	0.2	130	0.2	1.0	0.06
		175	654.840A	0.2	60	1.50	0.25	3.0	0.12	651.824	0.1	60	0.1	0.5	0.04
		200	654.840A	0.2	25	1.00	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	65	654.856	0.4	180	2.50	0.25	4.0	0.15	651.734	0.4	320	0.2	0.8	0.10
		85	654.856	0.4	100	2.00	0.20	3.5	0.12	651.737	0.3	250	0.2	0.6	0.08
		100	654.846	0.2	60	1.50	0.20	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	180	2.50	0.25	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		150	654.846	0.2	120	2.00	0.20	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.50	0.20	2.5	0.12	651.824	0.1	60	0.1	0.3	0.04
		200	654.846	0.2	25	1.00	0.20	2.0	0.12	651.824	0.1	25	0.1	0.3	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	65	654.856	0.4	180	2.50	0.30	4.0	0.15	651.737	0.3	320	0.2	0.8	0.08
		85	654.856	0.4	100	2.00	0.25	3.5	0.12	651.837	0.2	250	0.2	0.6	0.06
		100	654.846	0.2	60	1.50	0.25	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	180	2.50	0.30	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		150	654.846	0.2	120	2.00	0.25	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.50	0.25	2.5	0.12	651.824	0.1	60	0.1	0.3	0.04
		200	654.846	0.2	25	1.00	0.25	2.0	0.12	651.824	0.1	25	0.1	0.3	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	65	654.856	0.4	150	2.50	0.30	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		85	654.856	0.4	90	2.00	0.25	3.5	0.12	651.837	0.2	200	0.2	0.6	0.06
		100	654.846	0.2	60	1.50	0.25	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	150	2.50	0.30	4.0	0.15	651.737	0.3	230	0.2	0.8	0.08
		150	654.846	0.2	100	2.00	0.25	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.50	0.25	2.5	0.12	651.824	0.1	60	0.1	0.3	0.04
		200	654.846	0.2	25	1.00	0.25	2.0	0.12	651.824	0.1	25	0.1	0.3	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	65	654.852	0.4	220	4.00	0.30	7.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		85	654.852	0.4	140	3.50	0.30	6.0	0.15	651.735	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	60	3.00	0.25	5.0	0.12	651.834	0.2	100	0.2	0.7	0.06
		115	654.852	0.4	220	4.00	0.30	7.0	0.15	651.734	0.4	280	0.2	1.0	0.10
		150	654.840A	0.2	140	3.50	0.30	6.0	0.15	651.834	0.2	150	0.2	0.8	0.06
		175	654.840A	0.2	60	3.00	0.25	4.0	0.12	651.824	0.1	60	0.1	0.7	0.04
		200	654.840A	0.2	25	2.00	0.25	3.0	0.12	651.824	0.1	25	0.1	0.6	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to mount a fine balanced tool shank with index "F", e.g. 324.312F.





	Workpiece material	Boring depth	Rough boring SW 20							Fine boring EWN 20					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	65	654.852	0.4	220	3.50	0.30	6.0	0.15	651.734	0.4	350	0.2	1.00	0.10
		85	654.852	0.4	140	3.00	0.30	5.0	0.15	651.735	0.3	260	0.2	0.80	0.08
		100	654.840A	0.2	60	2.50	0.25	4.0	0.12	651.834	0.2	100	0.2	0.70	0.06
		115	654.852	0.4	220	3.50	0.30	6.0	0.15	651.734	0.4	280	0.2	1.00	0.10
		150	654.840A	0.2	140	3.00	0.30	5.0	0.15	651.834	0.2	150	0.2	1.00	0.06
		175	654.840A	0.2	60	2.50	0.25	4.0	0.12	651.824	0.1	60	0.1	0.50	0.04
		200	654.840A	0.2	25	2.00	0.25	3.0	0.12	651.824	0.1	25	0.1	0.50	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	65	654.856	0.4	180	2.50	0.25	4.0	0.15	651.734	0.4	320	0.2	0.80	0.10
		85	654.856	0.4	100	2.00	0.20	3.5	0.12	651.737	0.3	250	0.2	0.60	0.08
		100	654.846	0.2	60	1.50	0.20	2.5	0.12	651.837	0.2	100	0.2	0.50	0.06
		115	654.856	0.4	180	2.50	0.25	4.0	0.15	651.737	0.3	250	0.2	0.80	0.08
		150	654.846	0.2	120	2.00	0.20	3.5	0.12	651.837	0.2	130	0.2	0.60	0.06
		175	654.846	0.2	60	1.50	0.20	2.5	0.12	651.824	0.1	60	0.1	0.30	0.04
		200	654.846	0.2	25	1.00	0.20	2.0	0.12	651.824	0.1	25	0.1	0.30	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	65	654.888	0.4	350	3.00	0.30	6.0	0.15	651.723	0.3	650	0.2	1.20	0.08
		85	654.888	0.4	200	3.00	0.30	5.0	0.15	651.723	0.3	350	0.2	1.00	0.08
		100	654.877	0.2	100	2.00	0.25	4.0	0.12	651.825	0.2	120	0.2	0.70	0.06
		115	654.888	0.4	350	3.00	0.30	6.0	0.15	651.723	0.3	450	0.2	1.20	0.08
		150	654.888	0.4	220	3.00	0.30	5.0	0.15	651.723	0.3	240	0.2	1.00	0.08
		175	654.877	0.2	100	2.00	0.25	4.0	0.12	651.823	0.1	150	0.1	0.90	0.04
		200	654.877	0.2	50	2.00	0.25	3.0	0.12	651.823	0.1	60	0.1	0.80	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	65	654.889	0.4	250	3.00	0.30	6.0	0.15	651.737	0.3	650	0.2	1.20	0.08
		85	654.889	0.4	200	3.00	0.30	5.0	0.15	651.737	0.3	350	0.2	1.00	0.08
		100	654.879	0.2	100	2.00	0.25	4.0	0.12	651.837	0.2	120	0.2	0.70	0.06
		115	654.889	0.4	250	3.00	0.30	6.0	0.15	651.737	0.3	450	0.2	1.20	0.08
		150	654.889	0.4	220	3.00	0.30	5.0	0.15	651.737	0.3	240	0.2	1.00	0.08
		175	654.879	0.2	100	2.00	0.25	4.0	0.12	651.824	0.1	150	0.1	0.90	0.04
		200	654.879	0.2	50	2.00	0.25	3.0	0.12	651.824	0.1	60	0.1	0.80	0.04
S	Titanium 3.7164	65	654.847	0.4	120	3.00	0.25	5.0	0.12	651.737	0.3	120	0.2	1.00	0.08
		85	654.847	0.4	80	2.00	0.20	3.5	0.10	651.837	0.2	80	0.2	0.80	0.06
		115	654.847	0.4	120	3.00	0.25	5.0	0.12	651.737	0.3	120	0.2	1.00	0.08
		150	654.847	0.4	120	2.00	0.20	3.5	0.10	651.837	0.2	70	0.2	0.80	0.06
		175	654.837	0.2	80	2.00	0.20	3.0	0.10	651.824	0.1	40	0.1	0.50	0.04
	Ni-basic-, Co-basic-, Alloys	65	654.847	0.4	50	3.00	0.20	4.0	0.10	651.839	0.2	50	0.1	0.50	0.06
		85	654.837	0.2	30	2.00	0.15	3.0	0.10	651.839	0.2	30	0.1	0.50	0.06
		115	654.847	0.4	50	3.00	0.20	4.0	0.10	651.839	0.2	40	0.1	0.50	0.06
		150	654.837	0.2	30	2.00	0.15	3.0	0.10	651.839	0.2	25	0.1	0.50	0.06

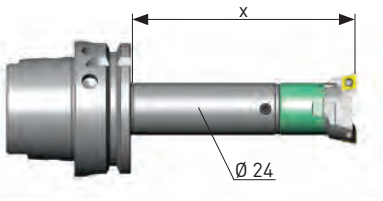
Remark:

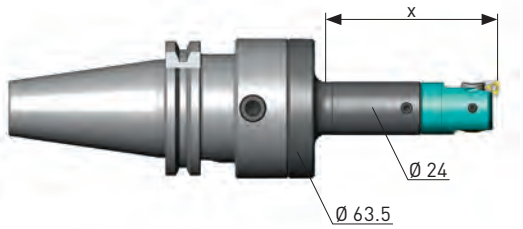
For a cost effective high volume production with boring depth X of 115 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.417 for the range Ø 25 - 31 mm.
- Fine Boring: Insert holder size 2, 626.112 for the range Ø 25 - 31 mm, insert holder size 3, 626.113 for the range Ø 30 - 36 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 15%, and by 30% when using insert holder size 3.

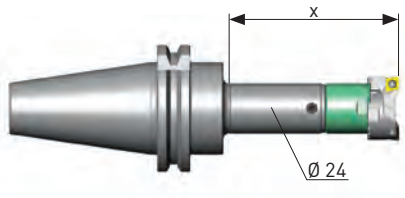


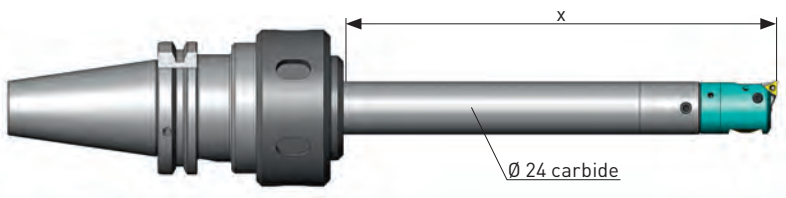


	Workpiece material	Boring depth	Rough boring SW 25							Fine boring EWN/EWB 25					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel	80	654.850A	0.4	220	3.5	0.35	6.0	0.18	651.713	0.4	400	0.2	1.2	0.10
	< 450 N/mm2	100	654.850A	0.4	125	2.5	0.30	5.0	0.15	651.738	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	2.0	0.25	4.0	0.12	651.838	0.2	100	0.2	0.8	0.06
	1.0037	130	654.850A	0.4	200	3.5	0.35	5.0	0.18	651.713	0.4	260	0.2	1.2	0.10
	1.0401	175	654.840A	0.2	100	2.5	0.30	4.0	0.15	651.838	0.2	130	0.2	1.0	0.06
	1.0715	200	654.840A	0.2	60	2.0	0.25	3.0	0.12	651.838	0.2	60	0.1	0.8	0.06
		250	654.840A	0.2	25	1.5	0.25	2.0	0.12	651.824	0.1	25	0.1	0.7	0.04
	Steel	80	654.850A	0.4	220	3.5	0.30	6.0	0.15	651.713	0.4	400	0.2	1.2	0.10
	450-850 N/mm2	100	654.850A	0.4	125	2.5	0.25	5.0	0.12	651.738	0.3	140	0.2	1.0	0.08
	1.0050	125	654.840A	0.2	60	2.0	0.25	4.0	0.12	651.838	0.2	100	0.2	0.8	0.06
	1.0503	130	654.850A	0.4	200	3.5	0.30	5.0	0.15	651.713	0.4	260	0.2	1.2	0.10
	1.1141	175	654.840A	0.2	100	2.5	0.25	4.0	0.12	651.838	0.2	130	0.2	1.0	0.06
	1.1191	200	654.840A	0.2	60	2.0	0.25	3.0	0.12	651.838	0.2	60	0.1	0.8	0.06
	1.5752	250	654.840A	0.2	25	1.5	0.25	2.0	0.12	651.824	0.1	25	0.1	0.7	0.04
	Steel	80	654.856	0.4	180	3.0	0.30	5.0	0.15	651.734	0.4	320	0.2	1.0	0.10
	850-1200 N/mm2	100	654.856	0.4	100	2.5	0.25	4.0	0.12	651.737	0.3	140	0.2	0.8	0.08
	1.2083	125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
	1.2294	130	654.856	0.4	160	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
	1.2312	175	654.846	0.2	90	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
	1.2344	200	654.846	0.2	60	2.0	0.25	3.0	0.12	651.824	0.1	60	0.1	0.6	0.04
	1.2764	250	654.846	0.2	25	1.5	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
M	Stainless steels,	80	654.856	0.4	180	3.0	0.30	5.0	0.15	651.737	0.3	320	0.2	1.0	0.08
	ferritic,	100	654.856	0.4	100	2.5	0.25	4.0	0.12	651.837	0.2	140	0.2	0.8	0.06
	martensitic	125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
	1.4016	130	654.856	0.4	160	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
	1.4024	175	654.846	0.2	90	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
	1.4034	200	654.846	0.2	60	2.0	0.25	3.0	0.12	651.824	0.1	60	0.1	0.6	0.04
	1.4762	250	654.846	0.2	25	1.5	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
	Stainless steels,	80	654.856	0.4	150	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
	austenitic	100	654.856	0.4	100	2.5	0.25	4.0	0.12	651.837	0.2	140	0.2	0.8	0.06
	1.4301	125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
	1.4311	130	654.856	0.4	150	3.0	0.30	5.0	0.15	651.737	0.3	230	0.2	1.0	0.08
	1.4401	175	654.846	0.2	90	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
	1.4435	200	654.846	0.2	60	2.0	0.25	3.0	0.12	651.824	0.1	60	0.1	0.6	0.04
	1.4571	250	654.846	0.2	25	1.5	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
K	Gray cast iron	80	654.852	0.4	220	5.0	0.30	8.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		100	654.852	0.4	140	4.0	0.30	7.0	0.15	651.632	0.3	140	0.2	1.0	0.08
	GG 15	125	654.840A	0.2	60	3.0	0.25	6.0	0.12	651.834	0.2	100	0.2	0.8	0.06
	GG 20	130	654.852	0.4	220	5.0	0.30	8.0	0.15	651.735	0.3	280	0.2	1.2	0.08
	GG 25	175	654.840A	0.2	100	4.0	0.30	7.0	0.15	651.834	0.2	150	0.2	1.0	0.06
	GG 30	200	654.840A	0.2	60	3.0	0.25	5.0	0.12	651.824	0.1	70	0.1	0.8	0.04
		250	654.840A	0.2	25	2.0	0.25	4.0	0.12	651.824	0.1	25	0.1	0.7	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 309.201 and 324.322F.





	Workpiece material	Boring depth	Rough boring SW 25							Fine boring EWN/EWB 25					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.852	0.4	220	4.00	0.30	7.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		100	654.852	0.4	140	3.50	0.30	6.0	0.15	651.735	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	3.00	0.25	5.0	0.12	651.834	0.2	100	0.2	0.8	0.06
		130	654.852	0.4	220	4.00	0.30	7.0	0.15	651.735	0.3	280	0.2	1.2	0.08
		175	654.840A	0.2	100	3.50	0.30	6.0	0.15	651.834	0.2	150	0.2	1.0	0.06
		200	654.840A	0.2	60	3.00	0.25	5.0	0.12	651.824	0.1	70	0.1	0.8	0.04
		250	654.840A	0.2	25	2.00	0.25	4.0	0.12	651.824	0.1	25	0.1	0.7	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.856	0.4	180	3.00	0.30	5.0	0.15	651.734	0.4	320	0.2	1.0	0.10
		100	654.856	0.4	100	2.50	0.25	4.0	0.12	651.737	0.3	140	0.2	0.8	0.08
		125	654.846	0.2	60	2.00	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
		130	654.856	0.4	160	3.00	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
		175	654.846	0.2	90	2.50	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
		200	654.846	0.2	60	2.00	0.25	3.0	0.12	651.824	0.1	60	0.1	0.6	0.04
		250	654.846	0.2	25	1.50	0.25	2.0	0.12	651.824	0.1	25	0.1	0.5	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.888	0.4	420	4.00	0.30	7.0	0.15	651.723	0.3	750	0.2	1.2	0.08
		100	654.888	0.4	200	3.00	0.30	6.0	0.15	651.723	0.3	200	0.2	1.2	0.08
		125	654.877	0.2	90	2.00	0.25	4.0	0.12	651.825	0.2	120	0.2	1.0	0.06
		130	654.888	0.4	420	4.00	0.30	7.0	0.15	651.723	0.3	450	0.2	1.2	0.08
		175	654.888	0.4	200	3.00	0.30	6.0	0.15	651.723	0.3	240	0.2	1.2	0.08
		200	654.877	0.2	100	2.00	0.25	4.0	0.12	651.825	0.2	150	0.2	1.0	0.06
		250	654.877	0.2	50	2.00	0.25	4.0	0.12	651.823	0.1	60	0.1	0.8	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.889	0.4	320	4.00	0.30	7.0	0.15	651.737	0.3	650	0.2	1.2	0.08
		100	654.889	0.4	200	3.00	0.30	6.0	0.15	651.737	0.3	200	0.2	1.2	0.08
		125	654.879	0.2	90	2.00	0.25	4.0	0.12	651.837	0.2	120	0.2	1.0	0.06
		130	654.889	0.4	320	4.00	0.30	7.0	0.15	651.737	0.3	450	0.2	1.2	0.08
		175	654.889	0.4	200	3.00	0.30	6.0	0.15	651.737	0.3	240	0.2	1.2	0.08
		200	654.879	0.2	100	2.00	0.25	4.0	0.12	651.837	0.2	150	0.2	1.0	0.06
		250	654.879	0.2	50	2.00	0.25	4.0	0.12	651.824	0.1	60	0.1	0.8	0.04
S	Titanium 3.7164	80	654.847	0.4	120	3.50	0.25	5.5	0.12	651.737	0.3	120	0.2	1.2	0.08
		100	654.847	0.4	80	2.50	0.20	4.0	0.10	651.837	0.2	80	0.2	1.0	0.06
		130	654.847	0.4	120	3.50	0.25	5.5	0.12	651.737	0.3	120	0.2	1.2	0.08
		175	654.847	0.4	120	2.50	0.20	4.0	0.10	651.837	0.2	70	0.1	1.0	0.06
		200	654.837	0.2	80	2.00	0.20	3.0	0.10	651.824	0.1	40	0.1	0.8	0.04
	Ni-basic-, Co-basic-, Alloys	80	654.847	0.4	50	3.00	0.20	4.0	0.10	651.839	0.2	50	0.2	0.8	0.06
		100	654.837	0.2	30	2.00	0.15	3.0	0.10	651.839	0.2	30	0.1	0.8	0.06
		130	654.847	0.4	50	3.00	0.20	4.0	0.10	651.839	0.2	40	0.1	0.6	0.06
		175	654.837	0.2	30	2.00	0.15	3.0	0.10	651.839	0.2	25	0.1	0.6	0.06

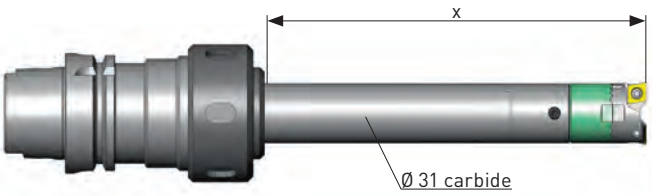
Remark:

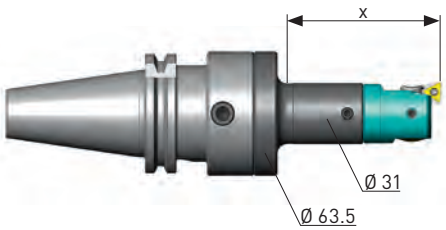
For a cost effective high volume production with boring depth X of 130 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.427 for the range Ø 32 - 40 mm
- Fine Boring: Insert holder size 2, 626.122 for the range Ø 32 - 40 mm, insert holder size 3, 626.123 for the range Ø 39 - 47 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 15%, and by 30% when using insert holder size 3.

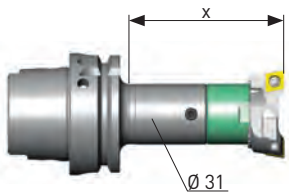


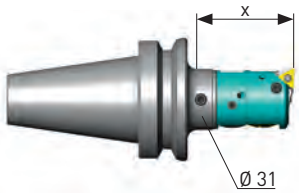


	Workpiece material	Boring depth	Rough boring SW 32							Fine boring EWN/EWB 32					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	80	654.950	0.8	240	4.50	0.40	8.00	0.20	655.385	0.4	400	0.2	1.2	0.10
		110	654.940A	0.4	240	4.50	0.35	7.50	0.20	655.385	0.4	260	0.2	1.2	0.10
		130	654.940A	0.4	160	4.00	0.30	7.00	0.17	655.375	0.2	160	0.2	1.0	0.06
		160	654.930A	0.2	80	3.50	0.30	5.50	0.15	655.375	0.2	80	0.2	0.8	0.06
		190	654.940A	0.4	120	3.00	0.30	4.50	0.15	655.375	0.2	150	0.2	1.2	0.06
		230	654.930A	0.2	70	2.00	0.25	3.50	0.12	655.363	0.1	80	0.1	0.9	0.04
		275	654.930A	0.2	25	1.50	0.25	3.00	0.12	655.363	0.1	25	0.1	0.7	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	80	654.950	0.8	220	4.50	0.35	8.00	0.17	655.385	0.4	400	0.2	1.2	0.10
		110	654.940A	0.4	220	4.50	0.30	7.50	0.17	655.385	0.4	260	0.2	1.2	0.10
		130	654.940A	0.4	160	4.00	0.30	7.00	0.15	655.375	0.2	160	0.2	1.0	0.06
		160	654.930A	0.2	80	3.50	0.30	5.50	0.12	655.375	0.2	80	0.2	0.8	0.06
		190	654.940A	0.4	120	3.00	0.25	4.50	0.15	655.375	0.2	150	0.2	1.2	0.06
		230	654.930A	0.2	70	2.00	0.25	3.50	0.12	655.363	0.1	80	0.1	0.9	0.04
		275	654.930A	0.2	25	1.50	0.25	3.00	0.12	655.363	0.1	25	0.1	0.7	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	80	654.955	0.8	200	4.00	0.35	7.50	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.00	0.30	7.00	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	3.50	0.30	6.00	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.00	0.30	5.00	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	100	2.50	0.25	4.00	0.12	655.319	0.2	140	0.2	1.0	0.06
		230	654.935	0.2	70	2.00	0.25	3.50	0.12	655.369	0.1	70	0.1	0.7	0.04
		275	654.935	0.2	25	1.50	0.25	3.00	0.12	655.369	0.1	25	0.1	0.6	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	80	654.955	0.8	200	4.00	0.35	7.50	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.00	0.30	7.00	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	3.50	0.30	6.00	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.00	0.30	5.00	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	100	2.50	0.25	4.00	0.12	655.319	0.2	140	0.2	1.0	0.06
		230	654.935	0.2	70	2.00	0.25	3.50	0.12	655.369	0.1	70	0.1	0.7	0.04
		275	654.935	0.2	25	1.50	0.25	3.00	0.12	655.369	0.1	25	0.1	0.6	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	80	654.955	0.8	160	4.00	0.35	7.00	0.17	655.318	0.4	280	0.2	1.0	0.10
		110	654.945	0.4	140	4.00	0.30	6.50	0.17	655.318	0.4	220	0.2	1.0	0.10
		130	654.945	0.4	110	3.50	0.30	6.00	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	70	3.00	0.30	5.00	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	90	2.50	0.25	4.00	0.12	655.319	0.2	140	0.2	1.0	0.06
		230	654.935	0.2	60	2.00	0.25	3.50	0.12	655.369	0.1	70	0.1	0.7	0.04
		275	654.935	0.2	25	1.50	0.25	3.00	0.12	655.369	0.1	25	0.1	0.6	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	80	654.952	0.8	240	7.00	0.40	10.00	0.20	655.393	0.8	350	0.2	1.3	0.14
		110	654.942	0.4	240	6.00	0.35	9.00	0.18	655.383	0.4	300	0.2	1.3	0.10
		130	654.942	0.4	160	5.50	0.30	8.00	0.15	655.383	0.4	160	0.2	1.1	0.10
		160	654.935	0.2	80	5.00	0.25	7.00	0.12	655.373	0.2	70	0.2	0.8	0.06
		190	654.942	0.4	130	4.50	0.25	6.00	0.12	655.383	0.4	150	0.2	1.2	0.10
		230	654.935	0.2	70	3.50	0.25	5.00	0.12	655.373	0.2	70	0.1	1.0	0.06
		275	654.935	0.2	25	2.50	0.25	4.00	0.12	655.363	0.1	25	0.1	0.7	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 309.301 and 324.331F.





	Workpiece material	Boring depth	Rough boring SW 32							Fine boring EWN/EWB 32					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.952	0.8	220	7.00	0.40	10.00	0.20	655.393	0.8	350	0.2	1.2	0.14
		110	654.942	0.4	220	6.00	0.35	9.00	0.18	655.383	0.4	300	0.2	1.2	0.10
		130	654.942	0.4	150	5.50	0.30	8.00	0.15	655.383	0.4	160	0.2	1.0	0.10
		160	654.935	0.2	80	5.00	0.25	7.00	0.12	655.373	0.2	70	0.2	0.7	0.06
		190	654.942	0.4	120	4.50	0.25	6.00	0.12	655.383	0.4	150	0.2	1.2	0.10
		230	654.935	0.2	70	3.50	0.25	5.00	0.12	655.373	0.2	70	0.1	0.9	0.06
		275	654.935	0.2	25	2.50	0.25	4.00	0.12	655.363	0.1	25	0.1	0.7	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.955	0.8	200	4.50	0.35	8.00	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.50	0.30	7.00	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	4.00	0.30	6.00	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.50	0.30	5.00	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	100	3.00	0.25	4.00	0.12	655.319	0.2	140	0.2	1.0	0.06
		230	654.935	0.2	70	2.00	0.25	3.50	0.12	655.369	0.1	70	0.1	0.7	0.04
		275	654.935	0.2	25	1.50	0.25	3.00	0.12	655.369	0.1	25	0.1	0.6	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.987	0.8	750	6.00	0.40	9.00	0.20	655.398	0.8	850	0.2	1.5	0.14
		110	654.987	0.8	400	5.50	0.40	8.00	0.20	655.398	0.8	400	0.2	1.5	0.14
		130	654.987	0.8	260	5.00	0.40	7.00	0.20	655.388	0.4	280	0.2	1.2	0.10
		160	654.977	0.4	120	4.00	0.30	7.00	0.17	655.378	0.2	140	0.2	1.0	0.06
		190	654.987	0.8	180	4.00	0.30	6.00	0.17	655.388	0.4	220	0.2	1.2	0.10
		230	654.977	0.4	60	3.00	0.25	5.00	0.12	655.378	0.2	80	0.1	1.0	0.06
		275	654.977	0.4	25	2.00	0.25	4.00	0.12	655.378	0.2	50	0.1	0.8	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.959	0.8	550	6.00	0.40	9.00	0.20	655.320	0.8	650	0.2	1.5	0.14
		110	654.959	0.8	380	5.50	0.40	8.00	0.20	655.320	0.8	400	0.2	1.5	0.14
		130	654.959	0.8	260	5.00	0.40	7.00	0.20	655.318	0.4	280	0.2	1.2	0.10
		160	654.949	0.4	120	4.00	0.30	7.00	0.17	655.319	0.2	140	0.2	1.0	0.06
		190	654.959	0.8	180	4.00	0.30	6.00	0.17	655.318	0.4	220	0.2	1.2	0.10
		230	654.949	0.4	60	3.00	0.25	5.00	0.12	655.319	0.2	80	0.1	1.0	0.06
		275	654.949	0.4	25	2.00	0.25	4.00	0.12	655.369	0.1	50	0.1	0.8	0.04
S	Titanium 3.7164	80	654.957	0.8	120	4.00	0.35	7.00	0.17	655.318	0.4	120	0.2	1.2	0.10
		110	654.957	0.8	120	4.00	0.35	7.00	0.17	655.318	0.4	120	0.2	1.2	0.10
		130	654.947	0.4	90	3.50	0.30	6.00	0.15	655.319	0.2	120	0.2	1.0	0.06
		160	654.947	0.4	60	3.00	0.25	5.00	0.12	655.319	0.2	80	0.2	0.8	0.06
		190	654.947	0.4	90	3.00	0.25	5.00	0.12	655.319	0.2	120	0.2	1.2	0.06
		230	654.947	0.4	60	2.50	0.25	4.00	0.12	655.369	0.1	70	0.1	0.9	0.04
		275	654.937	0.2	25	2.00	0.20	3.00	0.12	655.369	0.1	40	0.1	0.7	0.04
	Ni-basic-, Co-basic-, Alloys	80	654.957	0.8	50	3.50	0.30	6.00	0.15	655.326	0.4	50	0.2	0.8	0.10
		110	654.947	0.4	35	3.00	0.30	5.00	0.15	655.326	0.4	50	0.2	0.8	0.10
		130	654.947	0.4	35	2.50	0.25	4.50	0.12	655.316	0.2	40	0.1	0.8	0.06
		160	654.937	0.2	30	2.00	0.20	4.00	0.10	655.316	0.2	30	0.1	0.6	0.06
		190	654.947	0.4	30	2.00	0.20	4.00	0.10	655.316	0.2	40	0.1	0.6	0.06
		230	654.937	0.2	30	2.00	0.20	3.00	0.10	655.316	0.2	25	0.1	0.6	0.06
		275													

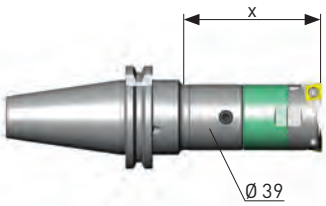
Remark:

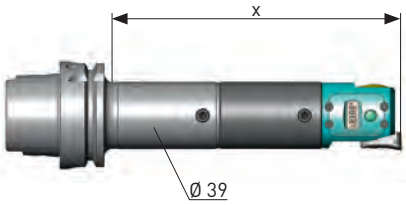
For a cost effective high volume production with boring depth X of 190 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.437 for the range Ø 41- 51 mm
- Fine Boring: Insert holder size 2, 626.132 for the range Ø 41 - 51mm, insert holder size 3, 626.133 for the range Ø 50 - 60 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 10%, and by 20% when using insert holder size 3.

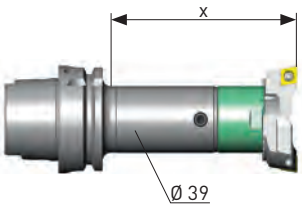


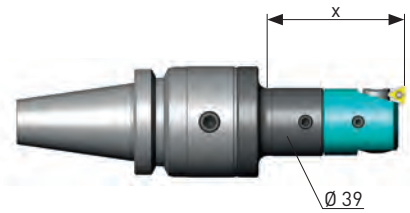


	Workpiece material	Boring depth	Rough boring SW 41							Fine boring EWN/EWE/EWB 41					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel	80	654.950	0.8	240	6.00	0.50	10.00	0.25	655.334	0.8	450	0.2	2.5	0.14
P	< 450 N/mm2	115	654.940A	0.4	240	5.50	0.45	9.00	0.25	655.324	0.4	280	0.2	2.0	0.10
P		140	654.940A	0.4	170	5.00	0.45	8.50	0.25	655.324	0.4	180	0.2	2.0	0.10
P	1.0037	160	654.940A	0.4	125	4.50	0.40	8.00	0.20	655.375	0.2	125	0.2	1.5	0.06
P	1.0401	175	654.940A	0.4	90	4.00	0.30	7.50	0.15	655.375	0.2	100	0.2	1.5	0.06
P	1.0715	200	654.930A	0.2	60	3.50	0.30	7.00	0.15	655.375	0.2	55	0.1	0.9	0.06
P		260	654.930A	0.2	150	3.50	0.30	6.00	0.15	655.324	0.4	200	0.2	0.9	0.10
P	Steel	80	654.950	0.8	220	6.00	0.45	10.00	0.22	655.334	0.8	450	0.2	2.5	0.14
P	450-850 N/mm2	115	654.940A	0.4	220	5.50	0.40	9.00	0.20	655.324	0.4	280	0.2	2.0	0.10
P	1.0050	140	654.940A	0.4	170	5.00	0.40	8.50	0.20	655.324	0.4	180	0.2	2.0	0.10
P	1.0503	160	654.940A	0.4	125	4.50	0.35	8.00	0.17	655.375	0.2	125	0.2	1.5	0.06
P	1.1141	175	654.940A	0.4	90	4.00	0.25	7.50	0.15	655.375	0.2	100	0.2	1.5	0.06
P	1.1191	200	654.930A	0.2	60	3.50	0.25	7.00	0.15	655.375	0.2	55	0.1	0.9	0.06
P	1.5752	260	654.930A	0.2	150	3.50	0.25	6.00	0.15	655.324	0.4	200	0.2	0.9	0.10
P	Steel	80	654.955	0.8	200	5.50	0.45	9.00	0.22	655.320	0.8	350	0.2	2.2	0.14
P	850-1200 N/mm2	115	654.945	0.4	180	5.00	0.40	8.50	0.20	655.318	0.4	260	0.2	1.8	0.10
P	1.2083	140	654.945	0.4	150	4.50	0.40	8.00	0.20	655.318	0.4	170	0.2	1.8	0.10
P	1.2294	160	654.945	0.4	120	4.00	0.35	7.50	0.17	655.319	0.2	125	0.2	1.2	0.06
P	1.2312	175	654.945	0.4	90	3.50	0.25	7.00	0.15	655.319	0.2	100	0.2	1.2	0.06
P	1.2344	200	654.935	0.2	60	3.00	0.25	6.00	0.15	655.319	0.2	55	0.1	0.7	0.06
P	1.2764	260	654.935	0.2	150	3.00	0.25	6.00	0.15	655.318	0.4	150	0.2	0.7	0.10
M	Stainless steels,	80	654.955	0.8	200	5.50	0.45	9.00	0.22	655.320	0.8	350	0.2	2.2	0.14
M	ferritic,	115	654.945	0.4	180	5.00	0.40	8.50	0.20	655.318	0.4	260	0.2	1.8	0.10
M	martensitic	140	654.945	0.4	150	4.50	0.40	8.00	0.20	655.318	0.4	170	0.2	1.8	0.10
M	1.4016	160	654.945	0.4	120	4.00	0.35	7.50	0.17	655.319	0.2	125	0.2	1.2	0.06
M	1.4024	175	654.945	0.4	90	3.50	0.25	7.00	0.15	655.319	0.2	100	0.2	1.2	0.06
M	1.4034	200	654.935	0.2	60	3.00	0.25	6.00	0.15	655.319	0.2	55	0.1	0.7	0.06
M	1.4762	260	654.935	0.2	150	3.00	0.25	6.00	0.15	655.318	0.4	170	0.2	0.7	0.10
M	Stainless steels,	80	654.955	0.8	160	5.50	0.45	9.00	0.22	655.320	0.8	280	0.2	2.2	0.14
M	austenitic	115	654.945	0.4	140	5.00	0.40	8.50	0.20	655.318	0.4	250	0.2	1.8	0.10
M	1.4301	140	654.945	0.4	140	4.50	0.40	8.00	0.20	655.318	0.4	160	0.2	1.8	0.10
M	1.4311	160	654.945	0.4	110	4.00	0.35	7.50	0.17	655.319	0.2	125	0.2	1.2	0.06
M	1.4401	175	654.945	0.4	90	3.50	0.25	7.00	0.15	655.319	0.2	100	0.2	1.2	0.06
M	1.4435	200	654.935	0.2	60	3.00	0.25	6.00	0.15	655.319	0.2	55	0.1	0.7	0.06
M	1.4571	260	654.935	0.2	150	3.00	0.25	6.00	0.15	655.318	0.4	170	0.2	0.7	0.10
K	Gray cast iron	80	654.952	0.8	240	9.00	0.50	15.00	0.25	655.303A	0.8	350	0.2	2.5	0.14
K		115	654.952	0.8	240	9.00	0.50	15.00	0.25	655.303A	0.8	300	0.2	2.5	0.14
K	GG 15	140	654.942	0.4	170	8.50	0.40	14.00	0.2	655.302A	0.4	180	0.2	2.0	0.10
K	GG 20	160	654.942	0.4	125	8.00	0.40	12.00	0.2	655.302A	0.4	125	0.2	2.0	0.10
K	GG 25	175	654.942	0.4	90	7.00	0.30	10.00	0.15	655.301A	0.2	100	0.2	1.5	0.06
K	GG 30	200	654.935	0.2	60	6.00	0.30	9.00	0.15	655.301A	0.2	55	0.1	0.9	0.06
K		260	654.935	0.2	150	5.00	0.30	8.00	0.15	655.302A	0.4	180	0.2	0.9	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 309.401 and 324.341F.





	Workpiece material	Boring depth	Rough boring SW 41							Fine boring EWN/EWE/EWB 41					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.952	0.8	220	9.00	0.50	15.00	0.25	655.390	0.8	350	0.2	2.5	0.14
		115	654.942	0.4	220	9.00	0.50	15.00	0.25	655.390	0.8	300	0.2	2.0	0.14
		140	654.942	0.4	170	8.50	0.40	14.00	0.20	655.380	0.4	180	0.2	2.0	0.10
		160	654.942	0.4	125	8.00	0.40	12.00	0.20	655.380	0.4	125	0.2	1.5	0.10
		175	654.942	0.4	90	7.00	0.30	11.00	0.15	655.370	0.2	100	0.2	1.5	0.06
		200	654.935	0.2	60	6.00	0.30	9.00	0.15	655.370	0.2	55	0.1	0.9	0.06
		260	654.935	0.2	150	5.00	0.30	8.00	0.15	655.380	0.4	180	0.2	0.9	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.955	0.8	200	6.00	0.45	10.00	0.22	655.320	0.8	320	0.2	2.2	0.14
		115	654.945	0.4	180	5.50	0.40	9.00	0.20	655.318	0.4	260	0.2	1.8	0.10
		140	654.945	0.4	150	5.00	0.40	8.50	0.20	655.318	0.4	170	0.2	1.8	0.10
		160	654.945	0.4	120	4.50	0.35	8.00	0.17	655.319	0.2	125	0.2	1.2	0.06
		175	654.945	0.4	90	4.00	0.25	7.50	0.15	655.319	0.2	100	0.2	1.2	0.06
		200	654.935	0.2	60	3.50	0.25	7.00	0.15	655.319	0.2	55	0.1	0.7	0.06
		260	654.935	0.2	150	3.50	0.25	6.00	0.15	655.318	0.4	170	0.2	0.7	0.10
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.987	0.8	850	7.00	0.50	11.00	0.25	655.398	0.8	1000	0.2	2.5	0.14
		115	654.987	0.8	500	7.00	0.50	11.00	0.25	655.398	0.8	600	0.2	2.5	0.14
		140	654.987	0.8	300	6.50	0.45	10.00	0.22	655.398	0.8	280	0.2	2.5	0.14
		160	654.987	0.8	220	6.00	0.45	10.00	0.22	655.388	0.4	210	0.2	2.0	0.10
		175	654.987	0.8	160	5.50	0.35	8.00	0.17	655.388	0.4	150	0.2	2.0	0.10
		200	654.977	0.4	100	5.00	0.30	8.00	0.15	655.378	0.2	100	0.2	1.0	0.06
		260	654.977	0.4	250	5.00	0.30	8.00	0.15	655.388	0.4	210	0.2	1.0	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.959	0.8	650	7.00	0.50	11.00	0.25	655.320	0.8	650	0.2	2.5	0.14
		115	654.959	0.8	450	7.00	0.50	11.00	0.25	655.320	0.8	500	0.2	2.5	0.14
		140	654.959	0.8	300	6.50	0.45	10.00	0.22	655.320	0.8	280	0.2	2.5	0.14
		160	654.949	0.4	220	6.00	0.45	10.00	0.22	655.318	0.4	210	0.2	2.0	0.10
		175	654.949	0.4	160	5.50	0.35	8.00	0.17	655.318	0.4	150	0.2	2.0	0.10
		200	654.949	0.4	100	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	1.0	0.06
		260	654.949	0.4	250	5.00	0.30	8.00	0.15	655.318	0.4	210	0.2	1.0	0.10
S	Titanium 3.7164	80	654.957	0.8	120	5.50	0.45	9.00	0.22	655.320	0.8	120	0.2	2.5	0.14
		115	654.957	0.8	120	5.00	0.40	8.50	0.20	655.320	0.8	120	0.2	2.0	0.14
		140	654.947	0.4	100	4.50	0.40	8.00	0.20	655.318	0.4	100	0.2	2.0	0.10
		160	654.947	0.4	100	4.00	0.35	7.50	0.17	655.318	0.4	80	0.2	1.5	0.10
		175	654.947	0.4	80	3.50	0.25	7.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		200	654.947	0.4	60	3.00	0.25	6.00	0.15	655.319	0.2	60	0.1	0.9	0.06
		260	654.937	0.2	100	3.00	0.25	6.00	0.15	655.318	0.4	100	0.1	0.9	0.10
	Ni-basic-, Co-basic-, Alloys	80	654.957	0.8	50	4.50	0.40	8.00	0.20	655.326	0.4	50	0.2	1.0	0.10
		115	654.947	0.4	50	4.00	0.35	7.00	0.17	655.326	0.4	50	0.2	1.0	0.10
		140	654.947	0.4	40	4.00	0.30	7.00	0.15	655.326	0.4	40	0.2	1.0	0.10
		160	654.937	0.2	40	3.50	0.30	6.00	0.15	655.316	0.2	30	0.1	0.8	0.06
		175	654.937	0.4	30	3.00	0.20	5.00	0.10	655.316	0.2	30	0.1	0.8	0.06
		200	654.937	0.2	40	3.00	0.20	5.00	0.10	655.316	0.2	30	0.1	0.6	0.06
		260	654.937	0.2	40	3.00	0.20	5.00	0.10	655.326	0.4	40	0.1	0.6	0.10

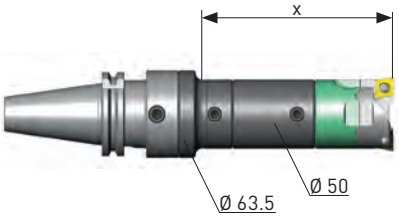
Remark:

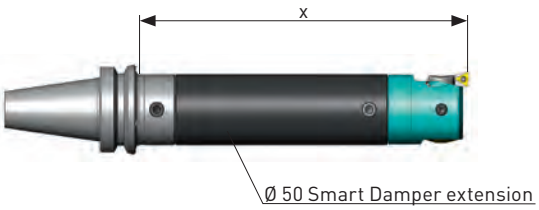
For the boring depth X = 260 mm, the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.447 for the range Ø 53 - 66 mm
- Fine Boring: Insert holder size 2, 626.142 for the range Ø 50 - 63 mm, Insert holder size 3, 626.143 for the range Ø 61 - 74 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 10%, and 20% when using insert holder size 3.

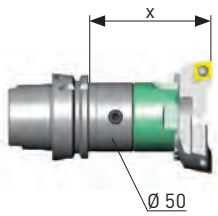


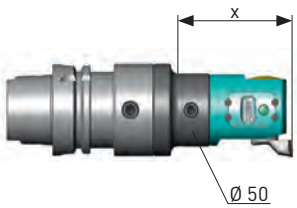


	Workpiece material	Boring depth	Rough boring SW 53							Fine boring EWN/EWE/EWB 53					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	80	654.990A	0.8	240	8.00	0.55	15.00	0.3	655.334	0.8	450	0.2	2.5	0.14
		115	654.990A	0.8	240	8.00	0.55	14.00	0.3	655.334	0.8	380	0.2	2.5	0.14
		145	654.993A	0.4	220	7.50	0.35	13.00	0.2	655.324	0.4	250	0.2	2.5	0.10
		175	654.993A	0.4	150	6.00	0.35	10.00	0.2	655.324	0.4	150	0.2	2.0	0.10
		205	654.993A	0.4	100	5.00	0.35	9.00	0.2	655.375	0.2	100	0.2	1.5	0.06
		220	654.993A	0.4	60	4.50	0.35	8.00	0.2	655.375	0.2	80	0.1	1.0	0.06
		310	654.993A	0.4	100	4.00	0.35	8.00	0.2	655.324	0.4	200	0.2	0.9	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	80	654.990A	0.8	220	8.00	0.50	15.00	0.25	655.334	0.8	450	0.2	2.5	0.14
		115	654.990A	0.8	220	8.00	0.50	14.00	0.25	655.334	0.8	380	0.2	2.5	0.14
		145	654.993A	0.4	200	7.50	0.30	13.00	0.15	655.324	0.4	250	0.2	2.5	0.10
		175	654.993A	0.4	140	6.00	0.30	10.00	0.15	655.324	0.4	150	0.2	2.0	0.10
		205	654.993A	0.4	100	5.00	0.30	9.00	0.15	655.375	0.2	100	0.2	1.5	0.06
		220	654.993A	0.4	60	4.50	0.30	8.00	0.15	655.375	0.2	80	0.1	1.0	0.06
		310	654.993A	0.4	100	4.00	0.30	8.00	0.15	655.324	0.4	200	0.2	0.9	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	80	654.965	0.8	200	7.50	0.50	14.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		115	654.965	0.8	200	7.00	0.50	13.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		145	654.964	0.4	180	6.50	0.30	12.00	0.15	655.318	0.4	240	0.2	2.0	0.10
		175	654.964	0.4	140	5.00	0.30	9.00	0.15	655.318	0.4	140	0.2	1.3	0.10
		205	654.964	0.4	100	4.50	0.30	8.00	0.15	655.319	0.2	100	0.2	1.3	0.06
		220	654.964	0.4	60	4.00	0.30	7.00	0.15	655.319	0.2	70	0.1	0.8	0.06
		310	654.964	0.4	100	4.00	0.30	7.00	0.15	655.318	0.4	150	0.2	0.7	0.10
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	80	654.965	0.8	200	7.50	0.50	14.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		115	654.965	0.8	200	7.00	0.50	13.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		145	654.964	0.4	180	6.50	0.30	12.00	0.15	655.318	0.4	240	0.2	2.0	0.10
		175	654.964	0.4	140	5.00	0.30	9.00	0.15	655.318	0.4	140	0.2	1.3	0.10
		205	654.964	0.4	100	4.50	0.30	8.00	0.15	655.319	0.2	100	0.2	1.3	0.06
		220	654.964	0.4	60	4.00	0.30	7.00	0.15	655.319	0.2	70	0.1	0.8	0.06
		310	654.964	0.4	100	4.00	0.30	7.00	0.15	655.318	0.4	170	0.2	0.7	0.10
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	80	654.965	0.8	160	7.50	0.50	14.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		115	654.965	0.8	160	7.00	0.50	13.00	0.25	655.320	0.8	280	0.2	2.0	0.10
		145	654.964	0.4	160	6.50	0.30	12.00	0.15	655.318	0.4	220	0.2	2.0	0.10
		175	654.964	0.4	130	5.00	0.30	9.00	0.15	655.318	0.4	140	0.2	1.3	0.06
		205	654.964	0.4	100	4.50	0.30	8.00	0.15	655.319	0.2	100	0.2	1.3	0.06
		220	654.964	0.4	60	4.00	0.30	7.00	0.15	655.319	0.2	70	0.1	0.8	0.06
		310	654.964	0.4	100	4.00	0.30	7.00	0.15	655.318	0.4	170	0.2	0.7	0.10
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	80	654.991	0.8	240	11.00	0.55	20.00	0.3	655.303A	0.8	350	0.2	2.5	0.14
		115	654.991	0.8	240	10.50	0.55	18.00	0.3	655.303A	0.8	350	0.2	2.5	0.14
		145	654.991	0.8	220	10.00	0.55	16.00	0.3	655.303A	0.8	240	0.2	2.5	0.10
		175	654.989	0.4	160	8.00	0.35	12.00	0.2	655.302A	0.4	150	0.2	2.0	0.10
		205	654.989	0.4	100	7.00	0.35	10.00	0.2	655.302A	0.4	100	0.2	1.5	0.10
		220	654.989	0.4	60	6.00	0.35	9.00	0.2	655.301A	0.2	70	0.1	1.0	0.06
		310	654.989	0.4	100	6.00	0.35	9.00	0.2	655.302A	0.4	180	0.2	0.9	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 309.501 and 324.352F.





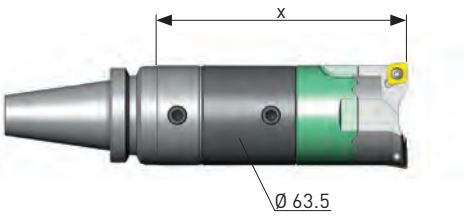
	Workpiece material	Boring depth	Rough boring SW 53							Fine boring EWN/EWE/EWB 53					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.991	0.8	220	11.00	0.55	20.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		115	654.991	0.8	220	10.50	0.55	18.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		145	654.989	0.4	200	10.00	0.35	16.00	0.30	655.380	0.4	240	0.2	2.5	0.10
		175	654.989	0.4	160	8.00	0.35	13.00	0.20	655.380	0.4	150	0.2	2.0	0.10
		205	654.989	0.4	100	7.00	0.35	10.00	0.20	655.370	0.2	100	0.2	1.5	0.06
		220	654.989	0.4	60	6.00	0.35	9.00	0.20	655.370	0.2	70	0.1	1.0	0.06
		310	654.989	0.4	100	6.00	0.35	9.00	0.20	655.380	0.4	180	0.2	0.9	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		115	654.965	0.8	200	8.50	0.50	15.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		145	654.964	0.4	180	8.00	0.30	13.00	0.15	655.318	0.4	240	0.2	2.0	0.10
		175	654.964	0.4	140	6.00	0.30	9.00	0.15	655.318	0.4	140	0.2	1.3	0.10
		205	654.964	0.4	100	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	1.3	0.06
		220	654.964	0.4	60	4.00	0.30	7.00	0.15	655.319	0.2	70	0.1	0.8	0.06
		310	654.964	0.4	140	4.00	0.30	7.00	0.15	655.318	0.4	170	0.2	0.7	0.10
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.992	0.8	550	10.00	0.55	18.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		115	654.992	0.8	550	9.00	0.55	16.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		145	654.992	0.8	400	8.00	0.55	14.00	0.30	655.398	0.8	400	0.2	2.5	0.14
		175	654.995	0.4	230	7.00	0.35	12.00	0.20	655.388	0.4	250	0.2	2.5	0.10
		205	654.995	0.4	165	6.00	0.35	10.00	0.20	655.388	0.4	170	0.2	2.0	0.10
		220	654.995	0.4	100	5.00	0.35	10.00	0.20	655.378	0.2	100	0.2	1.5	0.06
		310	654.995	0.4	230	5.00	0.35	10.00	0.20	655.388	0.4	210	0.2	1.5	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.979	0.8	550	10.00	0.55	18.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		115	654.979	0.8	550	9.00	0.55	16.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		145	654.979	0.8	400	8.00	0.55	14.00	0.30	655.320	0.8	400	0.2	2.5	0.14
		175	654.978	0.4	230	7.00	0.35	12.00	0.20	655.318	0.4	250	0.2	2.5	0.10
		205	654.978	0.4	165	6.00	0.35	10.00	0.20	655.318	0.4	170	0.2	2.0	0.10
		220	654.978	0.4	100	5.00	0.35	10.00	0.20	655.319	0.2	100	0.2	1.5	0.06
		310	654.978	0.4	230	5.00	0.35	10.00	0.20	655.318	0.4	210	0.2	1.5	0.10
S	Titanium 3.7164	80	654.969	0.8	120	7.50	0.50	14.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		115	654.969	0.8	120	7.00	0.50	13.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		145	654.968	0.4	120	6.50	0.30	12.00	0.15	655.318	0.4	100	0.2	2.5	0.10
		175	654.968	0.4	100	5.00	0.30	9.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		205	654.968	0.4	80	4.50	0.30	8.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		220	654.968	0.4	60	4.00	0.30	7.00	0.15	655.319	0.2	60	0.1	1.0	0.06
		310	654.968	0.4	100	4.00	0.30	7.00	0.15	655.318	0.4	100	0.1	0.9	0.10
	Ni-basic-, Co-basic-, Alloys	80	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.0	0.10
		115	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.0	0.10
		145	654.968	0.4	40	5.00	0.25	8.00	0.12	655.326	0.4	40	0.2	1.0	0.10
		175	654.968	0.4	40	4.00	0.25	7.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		205	654.968	0.4	30	3.00	0.25	5.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		220	654.968	0.4	30	3.00	0.25	5.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		310	654.968	0.4	40	3.00	0.25	5.00	0.12	655.326	0.4	40	0.1	0.6	0.10

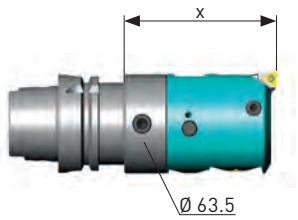
Remark:

For the boring depth X = 310 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.457 for the range Ø 69 - 86 mm
- Fine Boring: Insert holder size 2, 626.152, for the range Ø 65 - 82 mm, insert holder size 3, 626.153, for the range Ø 78 - 95 mm



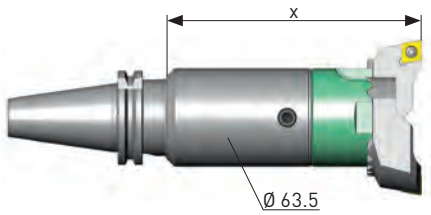


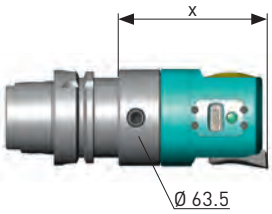
	Workpiece material	Boring depth	Rough boring SW 68							Fine boring EWN/EWE/EWB 68					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel	90	654.990A	0.8	240	10.00	0.55	18.0	0.30	655.334	0.8	450	0.2	2.5	0.14
	< 450 N/mm2	110	654.990A	0.8	240	10.00	0.55	18.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		140	654.990A	0.8	220	9.00	0.55	16.0	0.30	655.334	0.8	350	0.2	2.5	0.14
	1.0037	170	654.993A	0.4	200	8.00	0.35	14.0	0.20	655.324	0.4	250	0.2	2.0	0.10
	1.0401	200	654.993A	0.4	130	7.00	0.35	12.0	0.20	655.324	0.4	150	0.2	1.5	0.10
	1.0715	230	654.993A	0.4	80	6.00	0.35	9.0	0.20	655.375	0.2	80	0.2	1.0	0.06
		340	654.993A	0.4	100	6.00	0.35	9.0	0.20	655.324	0.4	200	0.2	1.0	0.10
	Steel	90	654.990A	0.8	220	10.00	0.50	18.0	0.25	655.334	0.8	450	0.2	2.5	0.14
	450-850 N/mm2	110	654.990A	0.8	220	10.00	0.50	18.0	0.25	655.334	0.8	450	0.2	2.5	0.14
	1.0050	140	654.990A	0.8	200	9.00	0.50	16.0	0.25	655.334	0.8	350	0.2	2.5	0.14
	1.0503	170	654.993A	0.4	180	8.00	0.30	14.0	0.15	655.324	0.4	250	0.2	2.0	0.10
	1.1141	200	654.993A	0.4	130	7.00	0.30	12.0	0.15	655.324	0.4	150	0.2	1.5	0.10
	1.1191	230	654.993A	0.4	80	6.00	0.30	9.0	0.15	655.375	0.2	80	0.2	1.0	0.06
	1.5752	340	654.993A	0.4	100	6.00	0.30	9.0	0.15	655.324	0.4	200	0.2	1.0	0.10
	Steel	90	654.965	0.8	200	9.00	0.50	16.0	0.25	655.320	0.8	350	0.2	2.0	0.14
	850-1200 N/mm2	110	654.965	0.8	200	9.00	0.50	16.0	0.25	655.320	0.8	350	0.2	2.0	0.14
	1.2083	140	654.965	0.8	180	8.00	0.50	15.0	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.2294	170	654.964	0.4	160	7.00	0.30	13.0	0.15	655.318	0.4	240	0.2	1.8	0.10
	1.2312	200	654.964	0.4	130	6.00	0.30	11.0	0.15	655.318	0.4	140	0.2	1.3	0.10
	1.2344	230	654.964	0.4	70	5.00	0.30	8.0	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.2764	340	654.964	0.4	100	5.00	0.30	8.0	0.15	655.318	0.4	150	0.2	0.8	0.10
M	Stainless steels,	90	654.965	0.8	200	9.00	0.50	16.0	0.25	655.320	0.8	350	0.2	2.0	0.14
	ferritic,	110	654.965	0.8	200	9.00	0.50	16.0	0.25	655.320	0.8	350	0.2	2.0	0.14
	martensitic	140	654.965	0.8	180	8.00	0.50	15.0	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.4016	170	654.964	0.4	160	7.00	0.30	13.0	0.15	655.318	0.4	240	0.2	1.8	0.10
	1.4024	200	654.964	0.4	130	6.00	0.30	11.0	0.15	655.319	0.2	140	0.2	1.3	0.06
	1.4034	230	654.964	0.4	70	5.00	0.30	8.0	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4762	340	654.964	0.4	100	5.00	0.30	8.0	0.15	655.318	0.4	170	0.2	0.8	0.10
	Stainless steels,	90	654.965	0.8	160	9.00	0.50	16.0	0.25	655.320	0.8	300	0.2	2.0	0.14
	austenitic	110	654.965	0.8	160	9.00	0.50	16.0	0.25	655.320	0.8	300	0.2	2.0	0.14
	1.4301	140	654.965	0.8	140	8.00	0.50	15.0	0.25	655.318	0.4	280	0.2	2.0	0.10
	1.4311	170	654.964	0.4	140	7.00	0.30	13.0	0.15	655.318	0.4	220	0.2	2.0	0.10
	1.4401	200	654.964	0.4	120	6.00	0.30	11.0	0.15	655.319	0.2	120	0.2	1.3	0.06
	1.4435	230	654.964	0.4	70	5.00	0.30	8.0	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4571	340	654.964	0.4	100	5.00	0.30	8.0	0.15	655.318	0.4	170	0.2	0.8	0.10
K	Gray cast iron	90	654.991	0.8	240	15.00	0.55	22.0	0.30	655.303A	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	240	15.00	0.55	22.0	0.30	655.303A	0.8	350	0.2	2.5	0.14
	GG 15	140	654.991	0.8	220	13.00	0.55	20.0	0.30	655.303A	0.8	300	0.2	2.5	0.14
	GG 20	170	654.991	0.8	200	12.00	0.55	18.0	0.30	655.302A	0.4	250	0.2	2.0	0.10
	GG 25	200	654.989	0.4	140	11.00	0.35	16.0	0.20	655.302A	0.4	140	0.2	1.5	0.10
	GG 30	230	654.989	0.4	80	9.00	0.35	13.0	0.20	655.301A	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	100	9.00	0.35	13.0	0.20	655.302A	0.4	180	0.2	1.0	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 309.601 aund 324.361F.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.





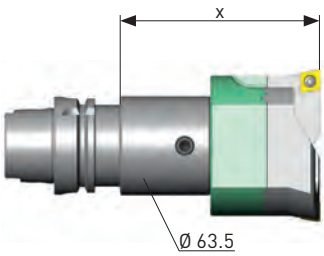
	Workpiece material	Boring depth	Rough boring SW 68							Fine boring EWN/EWE/EWB 68					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	90	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		140	654.991	0.8	200	13.00	0.55	20.00	0.30	655.390	0.8	300	0.2	2.5	0.14
		170	654.989	0.4	180	12.00	0.35	18.00	0.20	655.380	0.4	250	0.2	2.0	0.10
		200	654.989	0.4	130	11.00	0.35	16.00	0.20	655.380	0.4	140	0.2	1.5	0.10
		230	654.989	0.4	80	9.00	0.35	13.00	0.20	655.370	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	100	9.00	0.35	13.00	0.20	655.380	0.4	180	0.2	1.0	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	90	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		110	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		140	654.965	0.8	180	10.00	0.50	18.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		170	654.964	0.4	160	9.00	0.30	16.00	0.15	655.318	0.4	240	0.2	1.8	0.10
		200	654.964	0.4	130	8.00	0.30	14.00	0.15	655.319	0.2	140	0.2	1.3	0.06
		230	654.964	0.4	70	7.00	0.30	11.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		340	654.964	0.4	140	7.00	0.30	11.00	0.15	655.318	0.4	170	0.2	0.8	0.10
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	90	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		110	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		140	654.992	0.8	400	11.00	0.55	18.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		170	654.992	0.8	350	10.00	0.55	16.00	0.30	655.398	0.8	400	0.2	2.5	0.14
		200	654.992	0.8	220	9.00	0.55	14.00	0.30	655.388	0.4	240	0.2	2.0	0.10
		230	654.995	0.4	120	8.00	0.35	11.00	0.20	655.378	0.2	120	0.2	1.5	0.06
		340	654.995	0.4	230	8.00	0.35	11.00	0.20	655.388	0.4	210	0.2	1.5	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	90	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		110	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		140	654.979	0.8	400	11.00	0.55	18.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		170	654.979	0.8	350	10.00	0.55	16.00	0.30	655.320	0.8	400	0.2	2.5	0.14
		200	654.978	0.4	220	9.00	0.35	14.00	0.20	655.318	0.4	240	0.2	2.0	0.10
		230	654.978	0.4	120	8.00	0.35	11.00	0.20	655.319	0.2	120	0.2	1.5	0.06
		340	654.978	0.4	230	8.00	0.35	11.00	0.20	655.318	0.4	210	0.2	1.5	0.10
S	Titanium 3.7164	90	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		110	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		140	654.969	0.8	120	8.00	0.50	15.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		170	654.968	0.4	100	7.00	0.30	13.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		200	654.968	0.4	80	6.00	0.30	11.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		230	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		340	654.968	0.4	100	5.00	0.30	8.00	0.15	655.318	0.4	100	0.2	1.0	0.10
	Ni-basic-, Co-basic-, Alloys	90	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		110	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		140	654.968	0.4	40	6.00	0.25	9.00	0.12	655.326	0.4	40	0.2	1.5	0.10
		170	654.968	0.4	40	5.00	0.25	8.00	0.12	655.316	0.2	30	0.1	1.0	0.06
		200	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		230	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		340	654.968	0.4	40	3.00	0.25	5.00	0.12	655.326	0.4	40	0.1	0.6	0.10

Remark:

For the boring depth X = 340 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.467 for the range Ø 88 - 110 mm
- Fine Boring: Insert holder size 2, 626.162, for the range Ø 94 - 126 mm, insert holder size 3, 626.163, for the range Ø 118 - 150 mm

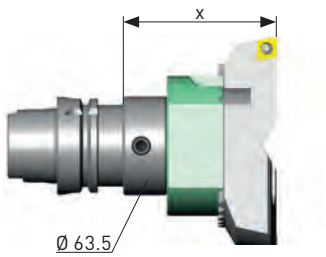


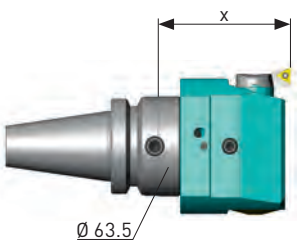
	Workpiece material	Boring depth	Rough boring SW 98							Fine boring EWN/EWE/EWB 100					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel	90	654.990A	0.8	240	10.00	0.55	18.00	0.30	655.334	0.8	450	0.2	2.5	0.14
	< 450 N/mm2	110	654.990A	0.8	240	10.00	0.55	18.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		140	654.990A	0.8	220	9.00	0.55	16.00	0.30	655.334	0.8	350	0.2	2.5	0.14
	1.0037	170	654.993A	0.4	200	8.00	0.35	14.00	0.20	655.324	0.4	250	0.2	2.0	0.10
	1.0401	200	654.993A	0.4	130	7.00	0.35	12.00	0.20	655.324	0.4	150	0.2	1.5	0.10
	1.0715	230	654.993A	0.4	80	6.00	0.35	9.00	0.20	655.375	0.2	80	0.2	1.0	0.06
		340	654.993A	0.4	60	6.00	0.35	9.00	0.20	655.375	0.2	100	0.2	1.0	0.06
	Steel	90	654.990A	0.8	220	10.00	0.50	18.00	0.25	655.334	0.8	450	0.2	2.5	0.14
	450-850 N/mm2	110	654.990A	0.8	220	10.00	0.50	18.00	0.25	655.334	0.8	450	0.2	2.5	0.14
	1.0050	140	654.990A	0.8	200	9.00	0.50	16.00	0.25	655.334	0.8	350	0.2	2.5	0.14
	1.0503	170	654.993A	0.4	180	8.00	0.30	14.00	0.15	655.324	0.4	250	0.2	2.0	0.10
	1.1141	200	654.993A	0.4	130	7.00	0.30	12.00	0.15	655.324	0.4	150	0.2	1.5	0.10
	1.1191	230	654.993A	0.4	80	6.00	0.30	9.00	0.15	655.375	0.2	80	0.2	1.0	0.06
	1.5752	340	654.993A	0.4	60	6.00	0.30	9.00	0.15	655.375	0.2	100	0.2	1.0	0.06
	Steel	90	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	850-1200 N/mm2	110	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	1.2083	140	654.965	0.8	180	8.00	0.50	15.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.2294	170	654.964	0.4	160	7.00	0.30	13.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.2312	200	654.964	0.4	130	6.00	0.30	11.00	0.15	655.318	0.4	140	0.2	1.0	0.10
	1.2344	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.2764	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
M	Stainless steels,	90	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	ferritic,	110	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	martensitic	140	654.965	0.8	180	8.00	0.50	15.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.4016	170	654.964	0.4	160	7.00	0.30	13.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.4024	200	654.964	0.4	130	6.00	0.30	11.00	0.15	655.319	0.2	140	0.2	1.0	0.06
	1.4034	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4762	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
	Stainless steels,	90	654.965	0.8	160	9.00	0.50	16.00	0.25	655.320	0.8	300	0.2	2.0	0.14
	austenitic	110	654.965	0.8	160	9.00	0.50	16.00	0.25	655.320	0.8	300	0.2	2.0	0.14
	1.4301	140	654.965	0.8	140	8.00	0.50	15.00	0.25	655.318	0.4	280	0.2	2.0	0.10
	1.4311	170	654.964	0.4	140	7.00	0.30	13.00	0.15	655.318	0.4	220	0.2	1.5	0.10
	1.4401	200	654.964	0.4	120	6.00	0.30	11.00	0.15	655.319	0.2	120	0.2	1.0	0.06
	1.4435	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4571	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
K	Gray cast iron	90	654.991	0.8	240	15.00	0.55	22.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	240	15.00	0.55	22.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
	GG 15	140	654.991	0.8	220	13.00	0.55	20.00	0.30	655.303A	0.8	300	0.2	2.5	0.14
	GG 20	170	654.991	0.8	200	12.00	0.55	18.00	0.30	655.302A	0.4	250	0.2	2.0	0.10
	GG 25	200	654.989	0.4	140	11.00	0.35	16.00	0.20	655.302A	0.4	140	0.2	1.5	0.10
	GG 30	230	654.989	0.4	80	9.00	0.35	13.00	0.20	655.301A	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	60	9.00	0.35	13.00	0.20	655.301A	0.2	100	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 310.607 and 324.361F.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.





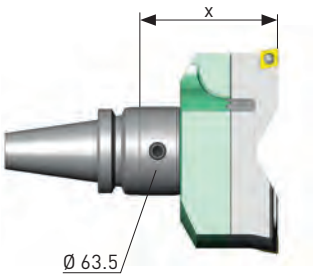
	Workpiece material	Boring depth	Rough boring SW 98							Fine boring EWN/EWE/EWB 100					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	90	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		140	654.991	0.8	200	13.00	0.55	20.00	0.30	655.390	0.8	300	0.2	2.5	0.14
		170	654.989	0.4	180	12.00	0.35	18.00	0.20	655.380	0.4	250	0.2	2.0	0.10
		200	654.989	0.4	130	11.00	0.35	16.00	0.20	655.380	0.4	140	0.2	1.5	0.10
		230	654.989	0.4	80	9.00	0.35	13.00	0.20	655.370	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	60	9.00	0.35	13.00	0.20	655.370	0.2	100	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	90	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		110	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		140	654.965	0.8	180	10.00	0.50	18.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		170	654.964	0.4	160	9.00	0.30	16.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		200	654.964	0.4	130	8.00	0.30	14.00	0.15	655.318	0.4	140	0.2	1.0	0.10
		230	654.964	0.4	70	7.00	0.30	11.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		340	654.964	0.4	60	7.00	0.30	11.00	0.15	655.319	0.2	100	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	90	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		110	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		140	654.992	0.8	400	11.00	0.55	18.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		170	654.992	0.8	350	10.00	0.55	16.00	0.30	655.388	0.4	400	0.2	2.5	0.10
		200	654.992	0.8	220	9.00	0.55	14.00	0.30	655.388	0.4	240	0.2	2.0	0.10
		230	654.995	0.4	120	8.00	0.35	11.00	0.20	655.378	0.2	120	0.2	1.5	0.06
		340	654.995	0.4	80	8.00	0.35	11.00	0.20	655.378	0.2	120	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	90	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		110	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		140	654.979	0.8	400	11.00	0.55	18.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		170	654.979	0.8	350	10.00	0.55	16.00	0.30	655.318	0.4	400	0.2	2.5	0.10
		200	654.978	0.4	220	9.00	0.35	14.00	0.20	655.318	0.4	240	0.2	2.0	0.10
		230	654.978	0.4	120	8.00	0.35	11.00	0.20	655.319	0.2	120	0.2	1.5	0.06
		340	654.978	0.4	80	8.00	0.35	11.00	0.20	655.319	0.2	120	0.2	1.5	0.06
S	Titanium 3.7164	90	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		110	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		140	654.969	0.8	120	8.00	0.50	15.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		170	654.968	0.4	100	7.00	0.30	13.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		200	654.968	0.4	80	6.00	0.30	11.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		230	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		340	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	90	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		110	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		140	654.968	0.4	40	6.00	0.25	9.00	0.12	655.326	0.4	40	0.2	1.5	0.10
		170	654.968	0.4	40	5.00	0.25	8.00	0.12	655.316	0.2	30	0.1	1.0	0.06
		200	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		230	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		340								655.316	0.2	30	0.1	0.6	0.06

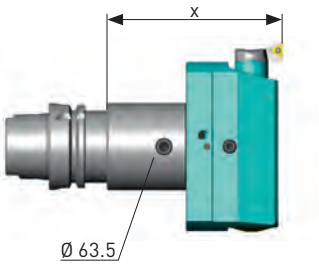
Remark:

For the boring depth X = 340 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.477 for the range Ø 125 - 153 mm
- Fine Boring: Insert holder size 2, 626.162, for the range Ø 126 - 179 mm, insert holder size 3, 626.163, for the range Ø 150 - 203 mm



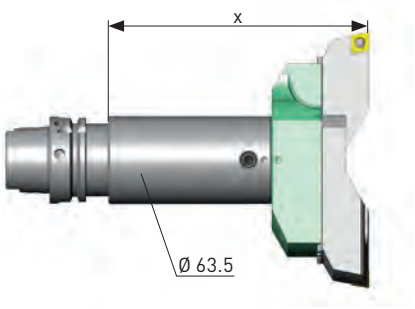


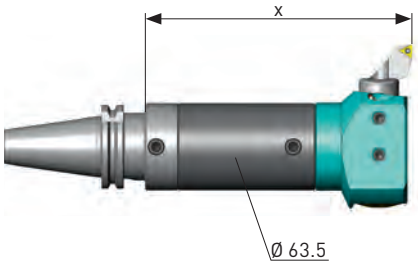
	Workpiece material	Boring depth	Rough boring SW 148							Fine boring EWN/EWE 100, EWB 150					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel	90	654.990A	0.8	240	10.00	0.55	18.00	0.30	655.334	0.8	450	0.2	2.5	0.14
	< 450 N/mm2	110	654.990A	0.8	240	10.00	0.55	18.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		140	654.990A	0.8	220	9.00	0.55	16.00	0.30	655.334	0.8	350	0.2	2.5	0.14
	1.0037	170	654.993A	0.4	200	8.00	0.35	14.00	0.20	655.324	0.4	250	0.2	2.0	0.10
	1.0401	200	654.993A	0.4	130	7.00	0.35	12.00	0.20	655.324	0.4	150	0.2	1.5	0.10
	1.0715	230	654.993A	0.4	80	6.00	0.35	9.00	0.20	655.375	0.2	80	0.2	1.0	0.06
		340	654.993A	0.4	60	6.00	0.35	9.00	0.20	655.375	0.2	100	0.2	1.0	0.06
	Steel	90	654.990A	0.8	220	10.00	0.50	18.00	0.25	655.334	0.8	450	0.2	2.5	0.14
	450-850 N/mm2	110	654.990A	0.8	220	10.00	0.50	18.00	0.25	655.334	0.8	450	0.2	2.5	0.14
	1.0050	140	654.990A	0.8	200	9.00	0.50	16.00	0.25	655.334	0.8	350	0.2	2.5	0.14
	1.0503	170	654.993A	0.4	180	8.00	0.30	14.00	0.15	655.324	0.4	250	0.2	2.0	0.10
	1.1141	200	654.993A	0.4	130	7.00	0.30	12.00	0.15	655.324	0.4	150	0.2	1.5	0.10
	1.1191	230	654.993A	0.4	80	6.00	0.30	9.00	0.15	655.375	0.2	80	0.2	1.0	0.06
	1.5752	340	654.993A	0.4	60	6.00	0.30	9.00	0.15	655.375	0.2	100	0.2	1.0	0.06
	Steel	90	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	850-1200 N/mm2	110	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	1.2083	140	654.965	0.8	180	8.00	0.50	15.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.2294	170	654.964	0.4	160	7.00	0.30	13.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.2312	200	654.964	0.4	130	6.00	0.30	11.00	0.15	655.318	0.4	140	0.2	1.0	0.10
	1.2344	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.2764	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
M	Stainless steels,	90	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	ferritic,	110	654.965	0.8	200	9.00	0.50	16.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	martensitic	140	654.965	0.8	180	8.00	0.50	15.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.4016	170	654.964	0.4	160	7.00	0.30	13.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.4024	200	654.964	0.4	130	6.00	0.30	11.00	0.15	655.319	0.2	140	0.2	1.0	0.06
	1.4034	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4762	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
	Stainless steels,	90	654.965	0.8	160	9.00	0.50	16.00	0.25	655.320	0.8	300	0.2	2.0	0.14
	austenitic	110	654.965	0.8	160	9.00	0.50	16.00	0.25	655.320	0.8	300	0.2	2.0	0.14
	1.4301	140	654.965	0.8	140	8.00	0.50	15.00	0.25	655.318	0.4	280	0.2	2.0	0.10
	1.4311	170	654.964	0.4	140	7.00	0.30	13.00	0.15	655.318	0.4	220	0.2	1.5	0.10
	1.4401	200	654.964	0.4	120	6.00	0.30	11.00	0.15	655.319	0.2	120	0.2	1.0	0.06
	1.4435	230	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4571	340	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	100	0.2	0.8	0.06
K	Gray cast iron	90	654.991	0.8	240	15.00	0.55	22.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	240	15.00	0.55	22.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
	GG 15	140	654.991	0.8	220	13.00	0.55	20.00	0.30	655.303A	0.8	300	0.2	2.5	0.14
	GG 20	170	654.991	0.8	200	12.00	0.55	18.00	0.30	655.302A	0.4	250	0.2	2.0	0.10
	GG 25	200	654.989	0.4	140	11.00	0.35	16.00	0.20	655.302A	0.4	140	0.2	1.5	0.10
	GG 30	230	654.989	0.4	80	9.00	0.35	13.00	0.20	655.301A	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	60	9.00	0.35	13.00	0.20	655.301A	0.2	100	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min, we recommend to balance the complete and pre-set tool assembly or to use a balanceable fine boring head on a fine balanced tool shank, e.g. 310.608 and 324.361F.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.





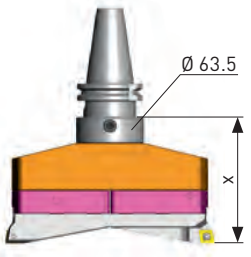
	Workpiece material	Boring depth	Rough boring SW 148							Fine boring EWN/EWE 100, EWB 150					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	90	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		110	654.991	0.8	220	15.00	0.55	22.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		140	654.991	0.8	200	13.00	0.55	20.00	0.30	655.390	0.8	300	0.2	2.5	0.14
		170	654.989	0.4	180	12.00	0.35	18.00	0.20	655.380	0.4	250	0.2	2.0	0.10
		200	654.989	0.4	130	11.00	0.35	16.00	0.20	655.380	0.4	140	0.2	1.5	0.10
		230	654.989	0.4	80	9.00	0.35	13.00	0.20	655.370	0.2	80	0.2	1.0	0.06
		340	654.989	0.4	60	9.00	0.35	13.00	0.20	655.370	0.2	100	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	90	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		110	654.965	0.8	200	12.00	0.50	20.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		140	654.965	0.8	180	10.00	0.50	18.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		170	654.964	0.4	160	9.00	0.30	16.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		200	654.964	0.4	130	8.00	0.30	14.00	0.15	655.318	0.4	140	0.2	1.0	0.10
		230	654.964	0.4	70	7.00	0.30	11.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		340	654.964	0.4	60	7.00	0.30	11.00	0.15	655.319	0.2	100	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	90	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		110	654.992	0.8	550	13.00	0.55	20.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		140	654.992	0.8	400	11.00	0.55	18.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		170	654.992	0.8	350	10.00	0.55	16.00	0.30	655.388	0.4	400	0.2	2.5	0.10
		200	654.992	0.8	220	9.00	0.55	14.00	0.30	655.388	0.4	240	0.2	2.0	0.10
		230	654.995	0.4	120	8.00	0.35	11.00	0.20	655.378	0.2	120	0.2	1.5	0.06
		340	654.995	0.4	80	8.00	0.35	11.00	0.20	655.378	0.2	120	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	90	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		110	654.979	0.8	550	13.00	0.55	20.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		140	654.979	0.8	400	11.00	0.55	18.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		170	654.979	0.8	350	10.00	0.55	16.00	0.30	655.318	0.4	400	0.2	2.5	0.10
		200	654.978	0.4	220	9.00	0.35	14.00	0.20	655.318	0.4	240	0.2	2.0	0.10
		230	654.978	0.4	120	8.00	0.35	11.00	0.20	655.319	0.2	120	0.2	1.5	0.06
		340	654.978	0.4	80	8.00	0.35	11.00	0.20	655.319	0.2	120	0.2	1.5	0.06
S	Titanium 3.7164	90	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		110	654.969	0.8	120	9.00	0.50	16.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		140	654.969	0.8	120	8.00	0.50	15.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		170	654.968	0.4	100	7.00	0.30	13.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		200	654.968	0.4	80	6.00	0.30	11.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		230	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		340	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	90	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		110	654.969	0.8	50	7.00	0.40	11.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		140	654.968	0.4	40	6.00	0.25	9.00	0.12	655.326	0.4	40	0.2	1.5	0.10
		170	654.968	0.4	40	5.00	0.25	8.00	0.12	655.316	0.2	30	0.1	1.0	0.06
		200	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		230	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		340								655.316	0.2	30	0.1	0.6	0.06

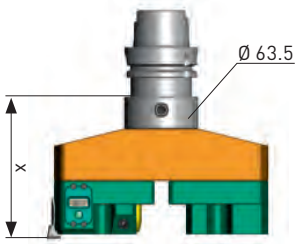
Remark:

For the boring depth X = 340 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.487 for the range Ø 175 - 203 mm
- Fine Boring: Insert holder size 3, 626.163, for the range Ø 150 - 203 mm





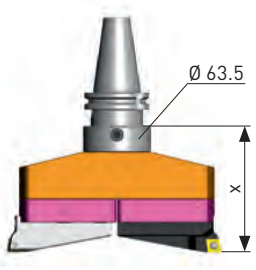
RSS

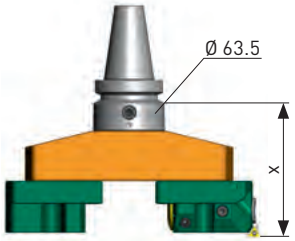
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2	115	654.990A	0.8	240	8.00	0.55	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		135	654.990A	0.8	240	8.00	0.55	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		175	654.990A	0.8	220	7.00	0.55	12.00	0.30	655.334	0.8	350	0.2	2.5	0.14
	1.0037	195	654.993A	0.4	200	6.00	0.35	10.00	0.20	655.324	0.4	250	0.2	2.0	0.10
	1.0401	215	654.993A	0.4	130	5.00	0.35	8.00	0.20	655.324	0.4	150	0.2	1.5	0.10
	1.0715	235	654.993A	0.4	80	4.00	0.35	6.00	0.20	655.375	0.2	80	0.2	1.0	0.06
		255	654.993A	0.4	60	4.00	0.35	6.00	0.20	655.375	0.2	60	0.2	1.0	0.06
	Steel 450-850 N/mm2	115	654.990A	0.8	220	8.00	0.50	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		135	654.990A	0.8	220	8.00	0.50	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
	1.0050	175	654.990A	0.8	200	7.00	0.50	12.00	0.30	655.334	0.8	350	0.2	2.5	0.14
	1.0503	195	654.993A	0.4	180	6.00	0.30	10.00	0.20	655.324	0.4	250	0.2	2.0	0.10
	1.1141	215	654.993A	0.4	130	5.00	0.30	8.00	0.20	655.324	0.4	150	0.2	1.5	0.10
	1.1191	235	654.993A	0.4	80	4.00	0.30	6.00	0.20	655.375	0.2	80	0.2	1.0	0.06
	1.5752	255	654.993A	0.4	60	4.00	0.30	6.00	0.20	655.375	0.2	60	0.2	1.0	0.06
	Steel 850-1200 N/mm2	115	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		135	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	1.2083	175	654.965	0.8	180	6.00	0.50	10.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.2294	195	654.964	0.4	160	5.00	0.30	8.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.2312	215	654.964	0.4	130	4.00	0.30	6.00	0.15	655.319	0.2	140	0.2	1.0	0.06
	1.2344	235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.2764	255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic	115	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		135	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
	1.4016	175	654.965	0.8	180	6.00	0.50	10.00	0.25	655.318	0.4	300	0.2	2.0	0.10
	1.4024	195	654.964	0.4	160	5.00	0.30	8.00	0.15	655.318	0.4	240	0.2	1.5	0.10
	1.4034	215	654.964	0.4	130	4.00	0.30	6.00	0.15	655.319	0.2	140	0.2	1.0	0.06
	1.4762	235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
	Stainless steels, austenitic	115	654.965	0.8	160	7.00	0.50	12.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		135	654.965	0.8	160	7.00	0.50	12.00	0.25	655.320	0.8	300	0.2	2.0	0.14
	1.4301	175	654.965	0.8	140	6.00	0.50	10.00	0.25	655.318	0.4	280	0.2	2.0	0.10
	1.4311	195	654.964	0.4	140	5.00	0.30	8.00	0.15	655.318	0.4	220	0.2	1.5	0.10
	1.4401	215	654.964	0.4	120	4.00	0.30	6.00	0.15	655.319	0.2	120	0.2	1.0	0.06
	1.4435	235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
	1.4571	255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
K	Gray cast iron	115	654.991	0.8	240	12.00	0.55	18.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
		135	654.991	0.8	240	12.00	0.55	18.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
	GG 15	175	654.991	0.8	220	10.00	0.55	16.00	0.30	655.303A	0.8	300	0.2	2.5	0.14
	GG 20	195	654.989	0.4	200	9.00	0.35	14.00	0.20	655.302A	0.4	250	0.2	2.0	0.10
	GG 25	215	654.989	0.4	140	8.00	0.35	12.00	0.20	655.302A	0.4	140	0.2	1.5	0.10
	GG 30	235	654.989	0.4	80	6.00	0.35	9.00	0.20	655.301A	0.2	80	0.2	1.0	0.06
		255	654.989	0.4	60	6.00	0.35	9.00	0.20	655.301A	0.2	60	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min we recommend to use the counter weight 318.105 and to balance it according to the table (see operating instructions).

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.





DVS

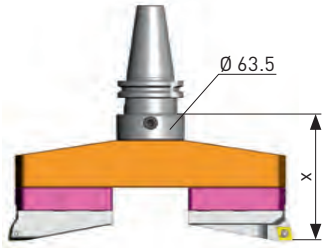
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	115	654.991	0.8	220	12.00	0.55	18.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		135	654.991	0.8	220	12.00	0.55	18.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		175	654.991	0.8	200	10.00	0.55	16.00	0.30	655.390	0.8	300	0.2	2.5	0.14
		195	654.989	0.4	180	9.00	0.35	14.00	0.20	655.380	0.4	250	0.2	2.0	0.10
		215	654.989	0.4	140	8.00	0.35	12.00	0.20	655.380	0.4	140	0.2	1.5	0.10
		235	654.989	0.4	80	6.00	0.35	9.00	0.20	655.370	0.2	80	0.2	1.0	0.06
		255	654.989	0.4	60	6.00	0.35	9.00	0.20	655.370	0.2	60	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	115	654.965	0.8	200	9.00	0.50	15.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		135	654.965	0.8	200	9.00	0.50	15.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		175	654.965	0.8	180	8.00	0.50	13.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		195	654.964	0.4	160	7.00	0.30	11.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		215	654.964	0.4	130	6.00	0.30	9.00	0.15	655.319	0.2	140	0.2	1.0	0.06
		235	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	50	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	115	654.992	0.8	550	10.00	0.55	16.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		135	654.992	0.8	550	10.00	0.55	16.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		175	654.992	0.8	400	9.00	0.55	14.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		195	654.995	0.4	350	8.00	0.35	12.00	0.20	655.388	0.4	400	0.2	2.5	0.10
		215	654.995	0.4	220	7.00	0.35	11.00	0.20	655.388	0.4	240	0.2	2.0	0.10
		235	654.995	0.4	120	6.00	0.35	10.00	0.20	655.378	0.2	120	0.2	1.5	0.06
		255	654.995	0.4	80	6.00	0.35	10.00	0.20	655.378	0.2	100	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	115	654.979	0.8	550	10.00	0.55	16.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		135	654.979	0.8	550	10.00	0.55	16.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		175	654.979	0.8	400	9.00	0.55	14.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		195	654.978	0.4	350	8.00	0.35	12.00	0.20	655.318	0.4	400	0.2	2.5	0.10
		215	654.978	0.4	220	7.00	0.35	11.00	0.20	655.318	0.4	240	0.2	2.0	0.10
		235	654.978	0.4	120	6.00	0.35	10.00	0.20	655.319	0.2	120	0.2	1.5	0.06
		255	654.978	0.4	80	6.00	0.35	10.00	0.20	655.319	0.2	100	0.2	1.5	0.06
S	Titanium 3.7164	115	654.969	0.8	120	8.00	0.50	13.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		135	654.969	0.8	120	8.00	0.50	13.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		175	654.969	0.8	120	8.00	0.50	13.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		195	654.968	0.4	100	6.00	0.30	11.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		215	654.968	0.4	80	5.00	0.30	8.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		235	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		255	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	115	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		135	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		175	654.968	0.4	40	5.00	0.25	8.00	0.12	655.326	0.4	40	0.2	1.5	0.10
		195	654.968	0.4	40	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	1.0	0.06
		215	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		235	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		255								655.316	0.2	30	0.1	0.6	0.06

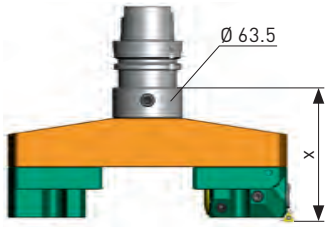
DVS rough boring

For double offset rough boring "DVS" a longer insert holder 637.951 / CC12 or 637.953 / CC16 has to be mounted on one side of the tool assembly. The longer insert holders are coloured black.

Extension of the boring range with additional insert holders:

• Fine Boring: Insert holder size 2, 626.272, for the range Ø 270 - 295 mm, insert holder size 3, 626.273, for the range Ø 295 - 320 mm





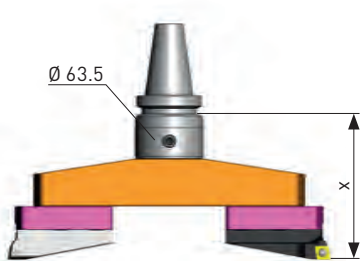
RSS

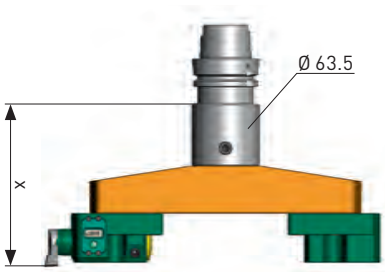
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	115	654.990A	0.8	240	8.00	0.55	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		135	654.990A	0.8	240	8.00	0.55	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		175	654.990A	0.8	220	7.00	0.55	12.00	0.30	655.334	0.8	350	0.2	2.5	0.14
		195	654.993A	0.4	200	6.00	0.35	10.00	0.20	655.324	0.4	250	0.2	2.0	0.10
		215	654.993A	0.4	130	5.00	0.35	8.00	0.20	655.324	0.4	150	0.2	1.5	0.10
		235	654.993A	0.4	80	4.00	0.35	6.00	0.20	655.375	0.2	80	0.2	1.0	0.06
		255	654.993A	0.4	60	4.00	0.35	6.00	0.20	655.375	0.2	60	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	115	654.990A	0.8	220	8.00	0.50	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		135	654.990A	0.8	220	8.00	0.50	14.00	0.30	655.334	0.8	450	0.2	2.5	0.14
		175	654.990A	0.8	200	7.00	0.50	12.00	0.30	655.334	0.8	350	0.2	2.5	0.14
		195	654.993A	0.4	180	6.00	0.30	10.00	0.20	655.324	0.4	250	0.2	2.0	0.10
		215	654.993A	0.4	130	5.00	0.30	8.00	0.20	655.324	0.4	150	0.2	1.5	0.10
		235	654.993A	0.4	80	4.00	0.30	6.00	0.20	655.375	0.2	80	0.2	1.0	0.06
		255	654.993A	0.4	60	4.00	0.30	6.00	0.20	655.375	0.2	60	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	115	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		135	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		175	654.965	0.8	180	6.00	0.50	10.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		195	654.964	0.4	160	5.00	0.30	8.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		215	654.964	0.4	130	4.00	0.30	6.00	0.15	655.319	0.2	140	0.2	1.0	0.06
		235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	115	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		135	654.965	0.8	200	7.00	0.50	12.00	0.25	655.320	0.8	350	0.2	2.0	0.14
		175	654.965	0.8	180	6.00	0.50	10.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		195	654.964	0.4	160	5.00	0.30	8.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		215	654.964	0.4	130	4.00	0.30	6.00	0.15	655.319	0.2	140	0.2	1.0	0.06
		235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	115	654.965	0.8	160	7.00	0.50	12.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		135	654.965	0.8	160	7.00	0.50	12.00	0.25	655.320	0.8	300	0.2	2.0	0.14
		175	654.965	0.8	140	6.00	0.50	10.00	0.25	655.318	0.4	280	0.2	2.0	0.10
		195	654.964	0.4	140	5.00	0.30	8.00	0.15	655.318	0.4	220	0.2	1.5	0.10
		215	654.964	0.4	120	4.00	0.30	6.00	0.15	655.319	0.2	120	0.2	1.0	0.06
		235	654.964	0.4	70	4.00	0.30	6.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	4.00	0.30	6.00	0.15	655.319	0.2	50	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	115	654.991	0.8	240	12.00	0.55	18.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
		135	654.991	0.8	240	12.00	0.55	18.00	0.30	655.303A	0.8	350	0.2	2.5	0.14
		175	654.991	0.8	220	10.00	0.55	16.00	0.30	655.303A	0.8	300	0.2	2.5	0.14
		195	654.989	0.4	200	9.00	0.35	14.00	0.20	655.302A	0.4	250	0.2	2.0	0.10
		215	654.989	0.4	140	8.00	0.35	12.00	0.20	655.302A	0.4	140	0.2	1.5	0.10
		235	654.989	0.4	80	6.00	0.35	9.00	0.20	655.301A	0.2	80	0.2	1.0	0.06
		255	654.989	0.4	60	6.00	0.35	9.00	0.20	655.301A	0.2	60	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 240 m/min we recommend to use the counter weight 318.105 and to balance it according to the table (see operating instructions).

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.





DVS

	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	115	654.991	0.8	220	12.00	0.55	18.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		135	654.991	0.8	220	12.00	0.55	18.00	0.30	655.390	0.8	350	0.2	2.5	0.14
		175	654.991	0.8	200	10.00	0.55	16.00	0.30	655.390	0.8	300	0.2	2.5	0.14
		195	654.989	0.4	180	9.00	0.35	14.00	0.20	655.380	0.4	250	0.2	2.0	0.10
		215	654.989	0.4	140	8.00	0.35	12.00	0.20	655.380	0.4	140	0.2	1.5	0.10
		235	654.989	0.4	80	6.00	0.35	9.00	0.20	655.370	0.2	80	0.2	1.0	0.06
		255	654.989	0.4	60	6.00	0.35	9.00	0.20	655.370	0.2	60	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	115	654.965	0.8	200	9.00	0.50	15.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		135	654.965	0.8	200	9.00	0.50	15.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		175	654.965	0.8	180	8.00	0.50	13.00	0.25	655.318	0.4	300	0.2	2.0	0.10
		195	654.964	0.4	160	7.00	0.30	11.00	0.15	655.318	0.4	240	0.2	1.5	0.10
		215	654.964	0.4	130	6.00	0.30	9.00	0.15	655.319	0.2	140	0.2	1.0	0.06
		235	654.964	0.4	70	5.00	0.30	8.00	0.15	655.319	0.2	70	0.2	0.8	0.06
		255	654.964	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	50	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	115	654.992	0.8	550	10.00	0.55	16.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		135	654.992	0.8	550	10.00	0.55	16.00	0.30	655.398	0.8	1200	0.2	2.5	0.14
		175	654.992	0.8	400	9.00	0.55	14.00	0.30	655.398	0.8	750	0.2	2.5	0.14
		195	654.995	0.4	350	8.00	0.35	12.00	0.20	655.388	0.4	400	0.2	2.5	0.10
		215	654.995	0.4	220	7.00	0.35	11.00	0.20	655.388	0.4	240	0.2	2.0	0.10
		235	654.995	0.4	120	6.00	0.35	10.00	0.20	655.378	0.2	120	0.2	1.5	0.06
		255	654.995	0.4	80	6.00	0.35	10.00	0.20	655.378	0.2	100	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	115	654.979	0.8	550	10.00	0.55	16.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		135	654.979	0.8	550	10.00	0.55	16.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		175	654.979	0.8	400	9.00	0.55	14.00	0.30	655.320	0.8	650	0.2	2.5	0.14
		195	654.978	0.4	350	8.00	0.35	12.00	0.20	655.318	0.4	400	0.2	2.5	0.10
		215	654.978	0.4	220	7.00	0.35	11.00	0.20	655.318	0.4	240	0.2	2.0	0.10
		235	654.978	0.4	120	6.00	0.35	10.00	0.20	655.319	0.2	120	0.2	1.5	0.06
		255	654.978	0.4	80	6.00	0.35	10.00	0.20	655.319	0.2	100	0.2	1.5	0.06
S	Titanium 3.7164	115	654.969	0.8	120	8.00	0.50	13.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		135	654.969	0.8	120	8.00	0.50	13.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		175	654.969	0.8	120	8.00	0.50	13.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		195	654.968	0.4	100	6.00	0.30	11.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		215	654.968	0.4	80	5.00	0.30	8.00	0.15	655.318	0.4	70	0.2	1.5	0.10
		235	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		255	654.968	0.4	60	5.00	0.30	8.00	0.15	655.319	0.2	60	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	115	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		135	654.969	0.8	50	6.00	0.40	10.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		175	654.968	0.4	40	5.00	0.25	8.00	0.12	655.326	0.4	40	0.2	1.5	0.10
		195	654.968	0.4	40	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	1.0	0.06
		215	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.8	0.06
		235	654.968	0.4	30	4.00	0.25	6.00	0.12	655.316	0.2	30	0.1	0.6	0.06
		255								655.316	0.2	30	0.1	0.6	0.06

DVS rough boring

For double offset rough boring "DVS" a longer insert holder 637.951 / CC12 or 637.953 / CC16 has to be mounted on one side of the tool assembly. The longer insert holders are coloured black.

Extension of the boring range with additional insert holders:

• Fine Boring: Insert holder size 2, 626.272, for the range Ø 340 - 365 mm, insert holder size 3, 626.273, for the range Ø 365 - 390 mm


BIG KAISER
319.601
SWISS MADE
SW68-110CKB6
RSS/BALANCE
DVS/STEP
BIG KAISER
BATTERY
CR 1025
Vc max.=
1200 m/min

With the exception of the diameter range 15 - 22 mm (page 38/39), which is covered by the fine boring heads EW 15 and EW 18, there is cutting data of one specific diameter range on each double page, which corresponds to the size of the rough- and the fine boring head.
For the diameter range bigger than 200 mm, the data is valid for light weight boring tools series 318.

The diameter ranges shown in the headline of each page will be reached for rough boring with a second pair of insert holders and for fine boring with additional insert holders size 2 and size 3.

The maximum values of the cutting data given in the tables require spindle speed of 12 500 rpm and spindle power of approx. 38 kW. In case of lower available speeds and spindle power, the cutting data has to be adapted accordingly.

The cutting data is valid for rough boring heads type SW, and for the fine boring heads type EWN, EWB/EWB-UP and EWE. The max. permissible cutting speeds to operate these heads are listed below and may not be exceeded at any time:

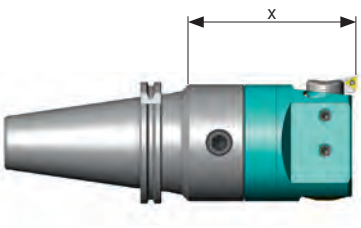
Rough boring heads type SW:	1 200 m/min
Fine boring heads EWN/EWE:	1 200 m/min
Balanceable fine boring heads EWB/EWB-UP:	2 000 m/min

In the table the following terms and dimensions are used:

Workpiece material:	Material no. according to DIN or generally used designation	
Boring depth X:	Projection length according to picture 1 and picture 2	
Insert:	Detailed information about the inserts is shown in the BIG KAISER main catalogue.	
R:	Nose radius	(mm)
Vc:	Cutting speed	(m/min)
Stock allow.:	Sock allowance per cut in Ø	(mm)
fn:	Feed per revolution	(mm/U)
Ra:	Surface roughness (Ra 1.6 µm for N7)	
RSS:	Rotationally symmetrical rough boring	page 7
DVS:	Double offset rough boring	page 7
VPS:	Full profile rough boring	page 8

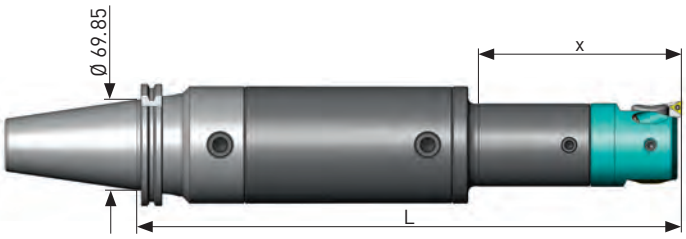
Diameter-length ratio

For long tool assemblies with different boring bar diameters, the boring depth X may not be the decisive factor for the cutting data to be applied, but the total tool length. Should the diameter-length ratio in relation to taper gauge diameter be bigger than 1:6, the lowest cutting data (highest X-value) has to be applied.



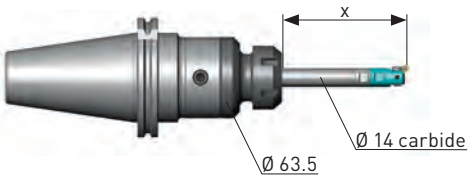
Picture 1

Boring depth X including the useable length of the tool shank and the boring head.

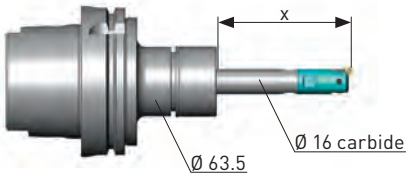


Picture 2

Boring depth X including the useable length of the reduction and the corresponding boring head.



EW 15

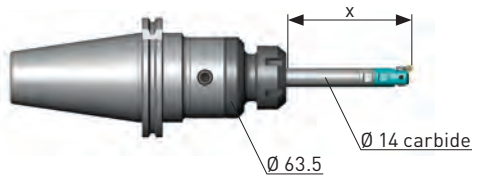


EW 18

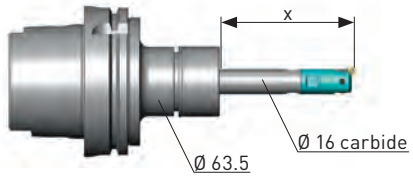
	Workpiece material	Boring depth	Fine boring EW 15						Fine boring EW 18					
			Inserts		Vc	Allow.		Feed	Inserts		Vc	Allow.		Feed
						Std. val.	Max.	Ra 1.6 µm				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Steel 450-850 N/mm2 1.005 1.0503 1.1141 1.1191 1.5752	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	50	655.602	0.2	320	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	200	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	150	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	50	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	260	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	190	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	140	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	50	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	250	0.2	0.5	0.06
		60	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	250	0.2	0.5	0.06
		80	655.602	0.2	225	0.2	0.5	0.06	655.602	0.2	225	0.2	0.5	0.06
		100	655.602	0.2	160	0.2	0.5	0.06	655.602	0.2	160	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	120	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	50	655.603	0.2	350	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		60	655.603	0.2	310	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		80	655.603	0.2	240	0.2	0.5	0.06	655.603	0.2	310	0.2	0.5	0.06
		100	655.603	0.2	180	0.2	0.5	0.06	655.603	0.2	240	0.2	0.5	0.06
		120	655.605	0.1	90	0.1	0.3	0.04	655.603	0.2	180	0.2	0.5	0.06
		140	655.605	0.1	40	0.1	0.3	0.04	655.605	0.1	100	0.1	0.3	0.04
		160							655.605	0.1	50	0.1	0.3	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to balance the complete and pre-set tool assembly.



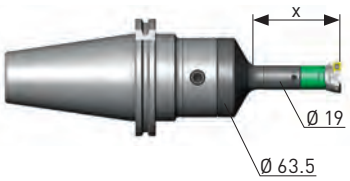
EW 15

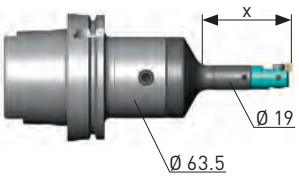


EW 18

	Workpiece material	Boring depth	Fine boring EW 15						Fine boring EW 18					
			Inserts		Vc	Allow.		Feed	Inserts		Vc	Allow.		Feed
						Std. val.	Max.	Ra 1.6 µm				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	50	655.603	0.2	350	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		60	655.603	0.2	310	0.2	0.5	0.06	655.603	0.2	350	0.2	0.5	0.06
		80	655.603	0.2	240	0.2	0.5	0.06	655.603	0.2	310	0.2	0.5	0.06
		100	655.603	0.2	180	0.2	0.5	0.06	655.603	0.2	240	0.2	0.5	0.06
		120	655.605	0.1	90	0.1	0.3	0.04	655.603	0.2	180	0.2	0.5	0.06
		140	655.605	0.1	40	0.1	0.3	0.04	655.605	0.1	100	0.1	0.3	0.04
		160							655.605	0.1	50	0.1	0.3	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	50	655.602	0.2	320	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		60	655.602	0.2	280	0.2	0.5	0.06	655.602	0.2	320	0.2	0.5	0.06
		80	655.602	0.2	240	0.2	0.5	0.06	655.602	0.2	280	0.2	0.5	0.06
		100	655.602	0.2	170	0.2	0.5	0.06	655.602	0.2	200	0.2	0.5	0.06
		120	655.606	0.1	90	0.1	0.3	0.04	655.602	0.2	150	0.2	0.5	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	90	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	50	655.601	0.2	550	0.2	0.5	0.06	655.601	0.2	700	0.2	0.5	0.06
		60	655.601	0.2	550	0.2	0.5	0.06	655.601	0.2	700	0.2	0.5	0.06
		80	655.601	0.2	400	0.2	0.5	0.06	655.601	0.2	650	0.2	0.5	0.06
		100	655.601	0.2	300	0.2	0.5	0.06	655.601	0.2	500	0.2	0.5	0.06
		120	655.601	0.2	150	0.2	0.3	0.06	655.601	0.2	300	0.2	0.5	0.06
		140	655.604	0.1	70	0.1	0.3	0.04	655.604	0.1	150	0.1	0.3	0.04
		160							655.604	0.1	70	0.1	0.3	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	50	655.602	0.2	400	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		60	655.602	0.2	330	0.2	0.5	0.06	655.602	0.2	400	0.2	0.5	0.06
		80	655.602	0.2	250	0.2	0.5	0.06	655.602	0.2	350	0.2	0.5	0.06
		100	655.602	0.2	180	0.2	0.5	0.06	655.602	0.2	300	0.2	0.5	0.06
		120	655.602	0.2	100	0.2	0.3	0.06	655.602	0.2	180	0.2	0.5	0.06
		140	655.606	0.1	50	0.1	0.3	0.04	655.606	0.1	100	0.1	0.3	0.04
		160							655.606	0.1	50	0.1	0.3	0.04
S	Titanium 3.7164	50	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		60	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		80	655.602	0.2	120	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		100	655.602	0.2	80	0.2	0.4	0.06	655.602	0.2	120	0.2	0.4	0.06
		120	655.606	0.1	60	0.1	0.3	0.04	655.602	0.2	80	0.2	0.4	0.06
		140	655.606	0.1	40	0.1	0.3	0.04	655.606	0.1	60	0.1	0.3	0.04
		160							655.606	0.1	40	0.1	0.3	0.04
	Ni-basic-, Co-basic-, Alloys	50	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		60	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		80	655.602	0.2	50	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		100	655.602	0.2	40	0.1	0.2	0.06	655.602	0.2	50	0.1	0.2	0.06
		120	655.606	0.1	30	0.1	0.2	0.04	655.606	0.1	40	0.1	0.2	0.04
		140							655.606	0.1	30	0.1	0.2	0.04
		160												

Remark:
The boring heads EW 15 and EW 18 will be screwed on carbide shanks 615.233 / 615.221 and 615.268 / 615.227 / 615.269 / 615.229. For chucking the carbide shanks, we recommend BIG MEGA Chuck collet holders.

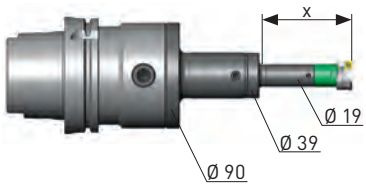


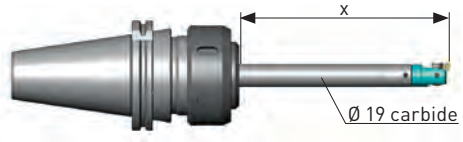


	Workpiece material	Boring depth	Rough boring SW 20							Fine boring EWN 20					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	65	654.850A	0.4	220	3.0	0.35	5.0	0.18	651.713	0.4	400	0.2	1.0	0.10
		85	654.850A	0.4	125	2.0	0.30	4.0	0.15	651.738	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	90	1.5	0.25	3.0	0.12	651.838	0.2	100	0.2	0.7	0.06
		115	654.850A	0.4	220	3.0	0.35	5.0	0.18	651.738	0.3	260	0.2	1.0	0.08
		150	654.840A	0.2	140	2.0	0.30	4.0	0.15	651.838	0.2	140	0.2	1.0	0.06
		175	654.840A	0.2	80	1.5	0.25	3.0	0.12	651.824	0.1	80	0.1	0.5	0.04
		200	654.840A	0.2	40	1.0	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	65	654.850A	0.4	220	3.0	0.30	5.0	0.15	651.713	0.4	400	0.2	1.0	0.10
		85	654.850A	0.4	125	2.0	0.25	4.0	0.12	651.738	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	90	1.5	0.25	3.0	0.12	651.838	0.2	100	0.2	0.7	0.06
		115	654.850A	0.4	220	3.0	0.30	5.0	0.15	651.738	0.3	260	0.2	1.0	0.08
		150	654.840A	0.2	140	2.0	0.25	4.0	0.12	651.838	0.2	140	0.2	1.0	0.06
		175	654.840A	0.2	80	1.5	0.25	3.0	0.12	651.824	0.1	80	0.1	0.5	0.04
		200	654.840A	0.2	40	1.0	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	65	654.856	0.4	200	2.5	0.25	4.0	0.15	651.734	0.4	320	0.2	0.8	0.10
		85	654.856	0.4	110	2.0	0.20	3.5	0.12	651.737	0.3	250	0.2	0.6	0.08
		100	654.846	0.2	80	1.5	0.20	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	200	2.5	0.25	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		150	654.846	0.2	120	2.0	0.20	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.5	0.20	2.5	0.12	651.824	0.1	70	0.1	0.3	0.04
		200	654.846	0.2	40	1.0	0.20	2.0	0.12	651.824	0.1	40	0.1	0.3	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	65	654.856	0.4	200	2.5	0.30	4.0	0.15	651.737	0.3	320	0.2	0.8	0.08
		85	654.856	0.4	110	2.0	0.25	3.5	0.12	651.837	0.2	250	0.2	0.6	0.06
		100	654.846	0.2	80	1.5	0.25	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	200	2.5	0.30	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		150	654.846	0.2	120	2.0	0.25	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.5	0.25	2.5	0.12	651.824	0.1	70	0.1	0.3	0.04
		200	654.846	0.2	40	1.0	0.25	2.0	0.12	651.824	0.1	40	0.1	0.3	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	65	654.856	0.4	180	2.5	0.30	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		85	654.856	0.4	100	2.0	0.25	3.5	0.12	651.837	0.2	200	0.2	0.6	0.06
		100	654.846	0.2	80	1.5	0.25	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	180	2.5	0.30	4.0	0.15	651.737	0.3	230	0.2	0.8	0.08
		150	654.846	0.2	120	2.0	0.25	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.5	0.25	2.5	0.12	651.824	0.1	60	0.1	0.3	0.04
		200	654.846	0.2	40	1.0	0.25	2.0	0.12	651.824	0.1	40	0.1	0.3	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	65	654.852	0.4	220	4.0	0.30	7.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		85	654.852	0.4	140	3.5	0.30	6.0	0.15	651.735	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	80	3.0	0.25	5.0	0.12	651.834	0.2	100	0.2	0.7	0.06
		115	654.852	0.4	220	4.0	0.30	7.0	0.15	651.734	0.4	280	0.2	1.0	0.10
		150	654.840A	0.2	140	3.5	0.30	6.0	0.15	651.834	0.2	150	0.2	0.8	0.06
		175	654.840A	0.2	80	3.0	0.25	4.0	0.12	651.824	0.1	80	0.1	0.7	0.04
		200	654.840A	0.2	40	2.0	0.25	3.0	0.12	651.824	0.1	40	0.1	0.6	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to balance the complete and pre-set tool assembly.





	Workpiece material	Boring depth	Rough boring SW 20							Fine boring EWN 20					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	65	654.852	0.4	220	3.5	0.30	6.0	0.15	651.734	0.4	350	0.2	1.0	0.10
		85	654.852	0.4	140	3.0	0.30	5.0	0.15	651.735	0.3	260	0.2	0.8	0.08
		100	654.840A	0.2	80	2.5	0.25	4.0	0.12	651.834	0.2	100	0.2	0.7	0.06
		115	654.852	0.4	220	3.5	0.30	6.0	0.15	651.734	0.4	280	0.2	1.0	0.10
		150	654.840A	0.2	140	3.0	0.30	5.0	0.15	651.834	0.2	150	0.2	1.0	0.06
		175	654.840A	0.2	80	2.5	0.25	4.0	0.12	651.824	0.1	80	0.1	0.5	0.04
		200	654.840A	0.2	40	2.0	0.25	3.0	0.12	651.824	0.1	40	0.1	0.5	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	65	654.856	0.4	200	2.5	0.25	4.0	0.15	651.734	0.4	320	0.2	0.8	0.10
		85	654.856	0.4	110	2.0	0.20	3.5	0.12	651.737	0.3	250	0.2	0.6	0.08
		100	654.846	0.2	80	1.5	0.20	2.5	0.12	651.837	0.2	100	0.2	0.5	0.06
		115	654.856	0.4	200	2.5	0.25	4.0	0.15	651.737	0.3	250	0.2	0.8	0.08
		150	654.846	0.2	120	2.0	0.20	3.5	0.12	651.837	0.2	130	0.2	0.6	0.06
		175	654.846	0.2	60	1.5	0.20	2.5	0.12	651.824	0.1	70	0.1	0.3	0.04
		200	654.846	0.2	40	1.0	0.20	2.0	0.12	651.824	0.1	40	0.1	0.3	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	65	654.888	0.4	350	3.0	0.30	6.0	0.15	651.723	0.3	650	0.2	1.2	0.08
		85	654.888	0.4	200	3.0	0.30	5.0	0.15	651.723	0.3	350	0.2	1.0	0.08
		100	654.877	0.2	100	2.0	0.25	4.0	0.12	651.825	0.2	120	0.2	0.7	0.06
		115	654.888	0.4	430	3.0	0.30	6.0	0.15	651.723	0.3	450	0.2	1.2	0.08
		150	654.888	0.4	230	3.0	0.30	5.0	0.15	651.723	0.3	240	0.2	1.0	0.08
		175	654.877	0.2	130	2.0	0.25	4.0	0.12	651.823	0.1	150	0.1	0.9	0.04
		200	654.877	0.2	70	2.0	0.25	3.0	0.12	651.823	0.1	60	0.1	0.8	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	65	654.889	0.4	250	3.0	0.30	6.0	0.15	651.737	0.3	650	0.2	1.2	0.08
		85	654.889	0.4	200	3.0	0.30	5.0	0.15	651.737	0.3	350	0.2	1.0	0.08
		100	654.879	0.2	100	2.0	0.25	4.0	0.12	651.837	0.2	120	0.2	0.7	0.06
		115	654.889	0.4	250	3.0	0.30	6.0	0.15	651.737	0.3	450	0.2	1.2	0.08
		150	654.889	0.4	230	3.0	0.30	5.0	0.15	651.737	0.3	240	0.2	1.0	0.08
		175	654.879	0.2	130	2.0	0.25	4.0	0.12	651.824	0.1	150	0.1	0.9	0.04
		200	654.879	0.2	70	2.0	0.25	3.0	0.12	651.824	0.1	60	0.1	0.8	0.04
S	Titanium 3.7164	65	654.847	0.4	120	3.0	0.25	5.0	0.12	651.737	0.3	120	0.2	1.0	0.08
		85	654.847	0.4	80	2.0	0.20	3.5	0.10	651.837	0.2	80	0.2	0.8	0.06
		115	654.847	0.4	120	3.0	0.25	5.0	0.12	651.737	0.3	120	0.2	1.0	0.08
		150	654.847	0.4	120	2.0	0.20	3.5	0.10	651.837	0.2	70	0.2	0.8	0.06
		175	654.837	0.2	80	2.0	0.20	3.0	0.10	651.824	0.1	40	0.1	0.5	0.04
	Ni-basic-, Co-basic-, Alloys	65	654.847	0.4	50	3.0	0.20	4.0	0.10	651.839	0.2	50	0.1	0.5	0.06
		85	654.837	0.2	30	2.0	0.15	3.0	0.10	651.839	0.2	30	0.1	0.5	0.06
		115	654.847	0.4	50	3.0	0.20	4.0	0.10	651.839	0.2	40	0.1	0.5	0.06
		150	654.837	0.2	30	2.0	0.15	3.0	0.10	651.839	0.2	25	0.1	0.5	0.06

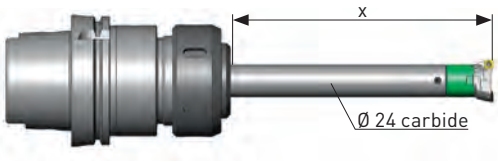
Remark:

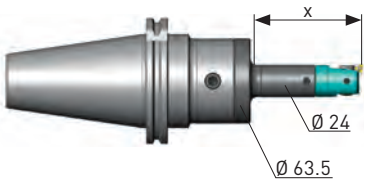
For a cost effective high volume production with boring depth X of 115 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.417 for the range Ø 25 - 31 mm
- Fine Boring: Insert holder size 2, 626.112, for the range Ø 25 - 31 mm, insert holder size 3, 626.113, for the range Ø 30 - 36 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 15%, and by 30% when using insert holder size 3.

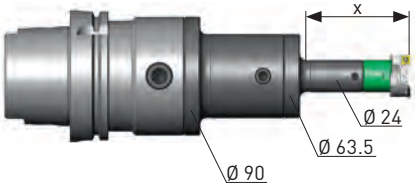


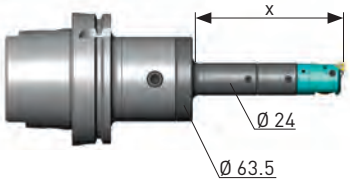


	Workpiece material	Boring depth	Rough boring SW 25							Fine boring EWN/EWB 25					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	80	654.850A	0.4	220	3.5	0.35	6.0	0.18	651.713	0.4	400	0.2	1.2	0.10
		100	654.850A	0.4	125	2.5	0.30	5.0	0.15	651.738	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	2.0	0.25	4.0	0.12	651.838	0.2	100	0.2	0.8	0.06
		130	654.850A	0.4	220	3.5	0.35	5.0	0.18	651.713	0.4	260	0.2	1.2	0.10
		175	654.840A	0.2	140	2.5	0.30	4.0	0.15	651.838	0.2	140	0.2	1.0	0.06
		200	654.840A	0.2	90	2.0	0.25	3.0	0.12	651.838	0.2	90	0.1	0.8	0.06
		250	654.840A	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.7	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	80	654.850A	0.4	220	3.5	0.30	6.0	0.15	651.713	0.4	400	0.2	1.2	0.10
		100	654.850A	0.4	125	2.5	0.25	5.0	0.12	651.738	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	2.0	0.25	4.0	0.12	651.838	0.2	100	0.2	0.8	0.06
		130	654.850A	0.4	220	3.5	0.30	5.0	0.15	651.713	0.4	260	0.2	1.2	0.10
		175	654.840A	0.2	140	2.5	0.25	4.0	0.12	651.838	0.2	140	0.2	1.0	0.06
		200	654.840A	0.2	90	2.0	0.25	3.0	0.12	651.838	0.2	90	0.1	0.8	0.06
		250	654.840A	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.7	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	80	654.856	0.4	200	3.0	0.30	5.0	0.15	651.734	0.4	320	0.2	1.0	0.10
		100	654.856	0.4	110	2.5	0.25	4.0	0.12	651.737	0.3	140	0.2	0.8	0.08
		125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
		130	654.856	0.4	200	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
		175	654.846	0.2	120	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
		200	654.846	0.2	80	2.0	0.25	3.0	0.12	651.824	0.1	80	0.1	0.6	0.04
		250	654.846	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	80	654.856	0.4	200	3.0	0.30	5.0	0.15	651.737	0.3	320	0.2	1.0	0.08
		100	654.856	0.4	110	2.5	0.25	4.0	0.12	651.837	0.2	140	0.2	0.8	0.06
		125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
		130	654.856	0.4	200	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
		175	654.846	0.2	120	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
		200	654.846	0.2	80	2.0	0.25	3.0	0.12	651.824	0.1	80	0.1	0.6	0.04
		250	654.846	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	80	654.856	0.4	180	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
		100	654.856	0.4	100	2.5	0.25	4.0	0.12	651.837	0.2	140	0.2	0.8	0.06
		125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
		130	654.856	0.4	180	3.0	0.30	5.0	0.15	651.737	0.3	230	0.2	1.0	0.08
		175	654.846	0.2	100	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
		200	654.846	0.2	80	2.0	0.25	3.0	0.12	651.824	0.1	70	0.1	0.6	0.04
		250	654.846	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	80	654.852	0.4	220	5.0	0.30	8.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		100	654.852	0.4	140	4.0	0.30	7.0	0.15	651.632	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	3.0	0.25	6.0	0.12	651.834	0.2	100	0.2	0.8	0.06
		130	654.852	0.4	220	5.0	0.30	8.0	0.15	651.735	0.3	280	0.2	1.2	0.08
		175	654.840A	0.2	100	4.0	0.30	7.0	0.15	651.834	0.2	150	0.2	1.0	0.06
		200	654.840A	0.2	90	3.0	0.25	5.0	0.12	651.824	0.1	90	0.1	0.8	0.04
		250	654.840A	0.2	45	2.0	0.25	4.0	0.12	651.824	0.1	40	0.1	0.7	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to use the balanceable fine boring head 309.201 and to balance the complete tool assembly.





	Workpiece material	Boring depth	Rough boring SW 25							Fine boring EWN/EWB 25					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.852	0.4	220	4.0	0.30	7.0	0.15	651.734	0.4	350	0.2	1.2	0.10
		100	654.852	0.4	140	3.5	0.30	6.0	0.15	651.735	0.3	140	0.2	1.0	0.08
		125	654.840A	0.2	60	3.0	0.25	5.0	0.12	651.834	0.2	100	0.2	0.8	0.06
		130	654.852	0.4	220	4.0	0.30	7.0	0.15	651.735	0.3	280	0.2	1.2	0.08
		175	654.840A	0.2	100	3.5	0.30	6.0	0.15	651.834	0.2	150	0.2	1.0	0.06
		200	654.840A	0.2	90	3.0	0.25	5.0	0.12	651.824	0.1	90	0.1	0.8	0.04
		250	654.840A	0.2	45	2.0	0.25	4.0	0.12	651.824	0.1	40	0.1	0.7	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.856	0.4	200	3.0	0.30	5.0	0.15	651.734	0.4	320	0.2	1.0	0.10
		100	654.856	0.4	110	2.5	0.25	4.0	0.12	651.737	0.3	140	0.2	0.8	0.08
		125	654.846	0.2	60	2.0	0.25	3.0	0.12	651.837	0.2	100	0.2	0.6	0.06
		130	654.856	0.4	200	3.0	0.30	5.0	0.15	651.737	0.3	250	0.2	1.0	0.08
		175	654.846	0.2	120	2.5	0.25	4.0	0.12	651.837	0.2	130	0.2	0.8	0.06
		200	654.846	0.2	80	2.0	0.25	3.0	0.12	651.824	0.1	80	0.1	0.6	0.04
		250	654.846	0.2	45	1.5	0.25	2.0	0.12	651.824	0.1	40	0.1	0.5	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.888	0.4	420	4.0	0.30	7.0	0.15	651.723	0.3	750	0.2	1.2	0.08
		100	654.888	0.4	200	3.0	0.30	6.0	0.15	651.723	0.3	200	0.2	1.2	0.08
		125	654.877	0.2	90	2.0	0.25	4.0	0.12	651.825	0.2	120	0.2	1.0	0.06
		130	654.888	0.4	560	4.0	0.30	7.0	0.15	651.723	0.3	550	0.2	1.2	0.08
		175	654.888	0.4	230	3.0	0.30	6.0	0.15	651.723	0.3	240	0.2	1.2	0.08
		200	654.877	0.2	150	2.0	0.25	4.0	0.12	651.825	0.2	150	0.2	1.0	0.06
		250	654.877	0.2	75	2.0	0.25	4.0	0.12	651.823	0.1	75	0.1	0.8	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.889	0.4	320	4.0	0.30	7.0	0.15	651.737	0.3	650	0.2	1.2	0.08
		100	654.889	0.4	200	3.0	0.30	6.0	0.15	651.737	0.3	200	0.2	1.2	0.08
		125	654.879	0.2	90	2.0	0.25	4.0	0.12	651.837	0.2	120	0.2	1.0	0.06
		130	654.889	0.4	320	4.0	0.30	7.0	0.15	651.737	0.3	550	0.2	1.2	0.08
		175	654.889	0.4	230	3.0	0.30	6.0	0.15	651.737	0.3	240	0.2	1.2	0.08
		200	654.879	0.2	150	2.0	0.25	4.0	0.12	651.837	0.2	150	0.2	1.0	0.06
		250	654.879	0.2	75	2.0	0.25	4.0	0.12	651.824	0.1	75	0.1	0.8	0.04
S	Titanium 3.7164	80	654.847	0.4	120	3.5	0.25	5.5	0.12	651.737	0.3	120	0.2	1.2	0.08
		100	654.847	0.4	80	2.5	0.20	4.0	0.10	651.837	0.2	80	0.2	1.0	0.06
		130	654.847	0.4	120	3.5	0.25	5.5	0.12	651.737	0.3	120	0.2	1.2	0.08
		175	654.847	0.4	120	2.5	0.20	4.0	0.10	651.837	0.2	70	0.1	1.0	0.06
		200	654.837	0.2	80	2.0	0.20	3.0	0.10	651.824	0.1	40	0.1	0.8	0.04
	Ni-basic-, Co-basic-, Alloys	80	654.847	0.4	50	3.0	0.20	4.0	0.10	651.839	0.2	50	0.2	0.8	0.06
		100	654.837	0.2	30	2.0	0.15	3.0	0.10	651.839	0.2	30	0.1	0.8	0.06
		130	654.847	0.4	50	3.0	0.20	4.0	0.10	651.839	0.2	40	0.1	0.6	0.06
		175	654.837	0.2	30	2.0	0.15	3.0	0.10	651.839	0.2	25	0.1	0.6	0.06

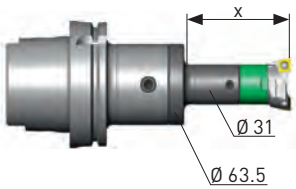
Remark:

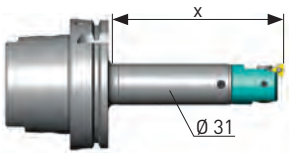
For a cost effective high volume production with boring depth X of 130 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.427 for the range Ø 32 - 40 mm
- Fine Boring: Insert holder size 2, 626.122, for the range Ø 32 - 40 mm, insert holder size 3, 626.123, for the range Ø 39 - 47 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 15%, and by 30% when using insert holder size 3.

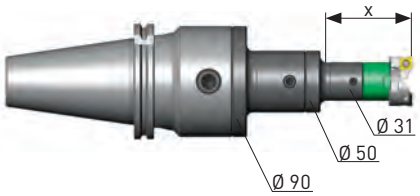


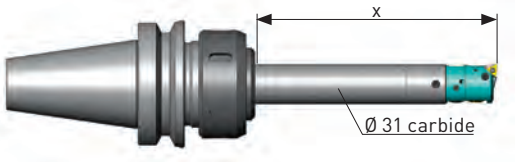


	Workpiece material	Boring depth	Rough boring SW 32							Fine boring EWN/EWB 32					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	80	654.950	0.8	240	4.5	0.40	8.0	0.20	655.385	0.4	400	0.2	1.2	0.10
		110	654.940A	0.4	240	4.5	0.35	7.5	0.20	655.385	0.4	260	0.2	1.2	0.10
		130	654.940A	0.4	160	4.0	0.30	7.0	0.17	655.375	0.2	160	0.2	1.0	0.06
		160	654.930A	0.2	80	3.5	0.30	5.5	0.15	655.375	0.2	80	0.2	0.8	0.06
		190	654.940A	0.4	180	3.0	0.30	4.5	0.15	655.375	0.2	200	0.2	1.2	0.06
		230	654.930A	0.2	120	2.0	0.25	3.5	0.12	655.363	0.1	100	0.1	0.9	0.04
		300	654.930A	0.2	40	1.5	0.25	3.0	0.12	655.363	0.1	40	0.1	0.7	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	80	654.950	0.8	220	4.5	0.35	8.0	0.17	655.385	0.4	400	0.2	1.2	0.10
		110	654.940A	0.4	220	4.5	0.30	7.5	0.17	655.385	0.4	260	0.2	1.2	0.10
		130	654.940A	0.4	160	4.0	0.30	7.0	0.15	655.375	0.2	160	0.2	1.0	0.06
		160	654.930A	0.2	80	3.5	0.30	5.5	0.12	655.375	0.2	80	0.2	0.8	0.06
		190	654.940A	0.4	180	3.0	0.25	4.5	0.15	655.375	0.2	200	0.2	1.2	0.06
		230	654.930A	0.2	120	2.0	0.25	3.5	0.12	655.363	0.1	100	0.1	0.9	0.04
		300	654.930A	0.2	40	1.5	0.25	3.0	0.12	655.363	0.1	40	0.1	0.7	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	80	654.955	0.8	200	4.0	0.35	7.5	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.0	0.30	7.0	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	3.5	0.30	6.0	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.0	0.30	5.0	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	160	2.5	0.25	4.0	0.12	655.319	0.2	180	0.2	1.0	0.06
		230	654.935	0.2	100	2.0	0.25	3.5	0.12	655.369	0.1	100	0.1	0.7	0.04
		300	654.935	0.2	40	1.5	0.25	3.0	0.12	655.369	0.1	40	0.1	0.6	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	80	654.955	0.8	200	4.0	0.35	7.5	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.0	0.30	7.0	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	3.5	0.30	6.0	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.0	0.30	5.0	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	160	2.5	0.25	4.0	0.12	655.319	0.2	180	0.2	1.0	0.06
		230	654.935	0.2	100	2.0	0.25	3.5	0.12	655.369	0.1	100	0.1	0.7	0.04
		300	654.935	0.2	40	1.5	0.25	3.0	0.12	655.369	0.1	40	0.1	0.6	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	80	654.955	0.8	160	4.0	0.35	7.0	0.17	655.318	0.4	280	0.2	1.0	0.10
		110	654.945	0.4	140	4.0	0.30	6.5	0.17	655.318	0.4	220	0.2	1.0	0.10
		130	654.945	0.4	110	3.5	0.30	6.0	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	70	3.0	0.30	5.0	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	140	2.5	0.25	4.0	0.12	655.319	0.2	160	0.2	1.0	0.06
		230	654.935	0.2	80	2.0	0.25	3.5	0.12	655.369	0.1	80	0.1	0.7	0.04
		300	654.935	0.2	40	1.5	0.25	3.0	0.12	655.369	0.1	40	0.1	0.6	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	80	654.952	0.8	240	7.0	0.40	10.0	0.20	655.393	0.8	350	0.2	1.3	0.14
		110	654.942	0.4	240	6.0	0.35	9.0	0.18	655.383	0.4	300	0.2	1.3	0.10
		130	654.942	0.4	160	5.5	0.30	8.0	0.15	655.383	0.4	160	0.2	1.1	0.10
		160	654.935	0.2	80	5.0	0.25	7.0	0.12	655.373	0.2	80	0.2	0.8	0.06
		190	654.942	0.4	180	4.5	0.25	6.0	0.12	655.383	0.4	200	0.2	1.2	0.10
		230	654.935	0.2	120	3.5	0.25	5.0	0.12	655.373	0.2	100	0.1	1.0	0.06
		300	654.935	0.2	40	2.5	0.25	4.0	0.12	655.363	0.1	40	0.1	0.7	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to use the balanceable fine boring heads, e.g. 309.301 or 310.305A and to balance the complete tool assembly.





	Workpiece material	Boring depth	Rough boring SW 32							Fine boring EWN/EWB 32					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	654.952	0.8	220	7.0	0.40	10.0	0.20	655.393	0.8	350	0.2	1.2	0.14
		110	654.942	0.4	220	6.0	0.35	9.0	0.18	655.383	0.4	300	0.2	1.2	0.10
		130	654.942	0.4	150	5.5	0.30	8.0	0.15	655.383	0.4	160	0.2	1.0	0.10
		160	654.935	0.2	80	5.0	0.25	7.0	0.12	655.373	0.2	70	0.2	0.7	0.06
		190	654.942	0.4	180	4.5	0.25	6.0	0.12	655.383	0.4	200	0.2	1.2	0.10
		230	654.935	0.2	120	3.5	0.25	5.0	0.12	655.373	0.2	100	0.1	0.9	0.06
		300	654.935	0.2	40	2.5	0.25	4.0	0.12	655.363	0.1	40	0.1	0.7	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	654.955	0.8	200	4.5	0.35	8.0	0.17	655.318	0.4	320	0.2	1.0	0.10
		110	654.945	0.4	180	4.5	0.30	7.0	0.17	655.318	0.4	240	0.2	1.0	0.10
		130	654.945	0.4	140	4.0	0.30	6.0	0.15	655.319	0.2	150	0.2	0.8	0.06
		160	654.935	0.2	80	3.5	0.30	5.0	0.15	655.319	0.2	70	0.2	0.6	0.06
		190	654.945	0.4	160	3.0	0.25	4.0	0.12	655.319	0.2	180	0.2	1.0	0.06
		230	654.935	0.2	100	2.0	0.25	3.5	0.12	655.369	0.1	100	0.1	0.7	0.04
		300	654.935	0.2	40	1.5	0.25	3.0	0.12	655.369	0.1	40	0.1	0.6	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	654.987	0.8	750	6.0	0.40	9.0	0.20	655.398	0.8	850	0.2	1.5	0.14
		110	654.987	0.8	400	5.5	0.40	8.0	0.20	655.398	0.8	400	0.2	1.5	0.14
		130	654.987	0.8	260	5.0	0.40	7.0	0.20	655.388	0.4	280	0.2	1.2	0.10
		160	654.977	0.4	120	4.0	0.30	7.0	0.17	655.378	0.2	140	0.2	1.0	0.06
		190	654.987	0.8	240	4.0	0.30	6.0	0.17	655.388	0.4	300	0.2	1.2	0.10
		230	654.977	0.4	160	3.0	0.25	5.0	0.12	655.378	0.2	160	0.1	1.0	0.06
		300	654.977	0.4	70	2.0	0.25	4.0	0.12	655.378	0.2	70	0.1	0.8	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	654.959	0.8	550	6.0	0.40	9.0	0.20	655.320	0.8	650	0.2	1.5	0.14
		110	654.959	0.8	380	5.5	0.40	8.0	0.20	655.320	0.8	400	0.2	1.5	0.14
		130	654.959	0.8	260	5.0	0.40	7.0	0.20	655.318	0.4	280	0.2	1.2	0.10
		160	654.949	0.4	120	4.0	0.30	7.0	0.17	655.319	0.2	140	0.2	1.0	0.06
		190	654.959	0.8	240	4.0	0.30	6.0	0.17	655.318	0.4	300	0.2	1.2	0.10
		230	654.949	0.4	160	3.0	0.25	5.0	0.12	655.319	0.2	160	0.1	1.0	0.06
		300	654.949	0.4	70	2.0	0.25	4.0	0.12	655.369	0.1	70	0.1	0.8	0.04
S	Titanium 3.7164	80	654.957	0.8	120	4.0	0.35	7.0	0.17	655.318	0.4	120	0.2	1.2	0.10
		110	654.957	0.8	120	4.0	0.35	7.0	0.17	655.318	0.4	120	0.2	1.2	0.10
		130	654.947	0.4	90	3.5	0.30	6.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		160	654.947	0.4	60	3.0	0.25	5.0	0.12	655.319	0.2	80	0.2	0.8	0.06
		190	654.947	0.4	90	3.0	0.25	5.0	0.12	655.319	0.2	120	0.2	1.2	0.06
		230	654.947	0.4	60	2.5	0.25	4.0	0.12	655.369	0.1	70	0.1	0.9	0.04
		300	654.937	0.2	25	2.0	0.20	3.0	0.12	655.369	0.1	40	0.1	0.7	0.04
	Ni-basic-, Co-basic-, Alloys	80	654.957	0.8	50	3.5	0.30	6.0	0.15	655.326	0.4	50	0.2	0.8	0.10
		110	654.947	0.4	35	3.0	0.30	5.0	0.15	655.326	0.4	50	0.2	0.8	0.10
		130	654.947	0.4	35	2.5	0.25	4.5	0.12	655.316	0.2	40	0.1	0.8	0.06
		160	654.937	0.2	30	2.0	0.20	4.0	0.10	655.316	0.2	30	0.1	0.6	0.06
		190	654.947	0.4	30	2.0	0.20	4.0	0.10	655.316	0.2	40	0.1	0.6	0.06
		230	654.937	0.2	30	2.0	0.20	3.0	0.10	655.316	0.2	25	0.1	0.6	0.06

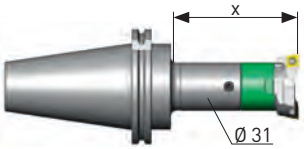
Remark:

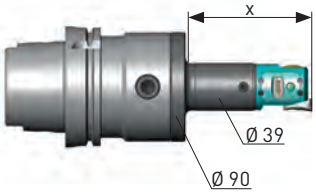
For a cost effective high volume production with boring depth X of 190 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.437 for the range Ø 41- 51 mm
- Fine Boring: Insert holder size 2, 626.132, for the range Ø 41 - 51mm, insert holder size 3 , 626.133, for the range Ø 50 - 60 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 10%, and by 20% when using insert holder size 3.

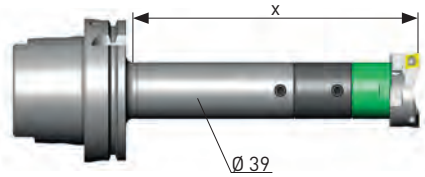


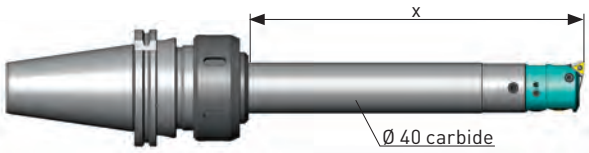


	Workpiece material	Boring depth	Rough boring SW 41							Fine boring EWN/EWB/EWE 41					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	100	654.950	0.8	240	6.0	0.50	10.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		160	654.940A	0.4	160	5.5	0.40	9.0	0.20	655.324	0.4	200	0.2	2.0	0.10
		200	654.930A	0.2	100	4.5	0.30	7.5	0.15	655.375	0.2	100	0.2	2.0	0.06
		240	654.940A	0.4	220	5.0	0.40	8.0	0.20	655.385	0.4	240	0.2	1.5	0.10
		280	654.930A	0.2	150	4.0	0.30	7.0	0.15	655.375	0.2	240	0.2	1.5	0.06
		340	654.930A	0.2	80	3.5	0.30	6.0	0.15	655.375	0.2	200	0.1	0.9	0.06
		400	654.930A	0.2	40	3.0	0.30	5.5	0.15	655.363	0.1	150	0.1	0.9	0.04
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	100	654.950	0.8	220	6.0	0.45	10.0	0.22	655.334	0.8	450	0.2	2.5	0.14
		160	654.940A	0.4	160	5.5	0.40	9.0	0.20	655.324	0.4	200	0.2	2.0	0.10
		200	654.930A	0.2	100	4.5	0.30	7.5	0.15	655.375	0.2	100	0.2	2.0	0.06
		240	654.940A	0.4	220	5.0	0.35	8.0	0.17	655.385	0.4	240	0.2	1.5	0.10
		280	654.930A	0.2	150	4.0	0.30	7.0	0.15	655.375	0.2	240	0.2	1.5	0.06
		340	654.930A	0.2	80	3.5	0.30	6.0	0.15	655.375	0.2	200	0.1	0.9	0.06
		400	654.930A	0.2	40	3.0	0.25	5.5	0.15	655.363	0.1	150	0.1	0.9	0.04
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	100	654.955	0.8	200	5.5	0.45	9.0	0.22	655.320	0.8	320	0.2	2.2	0.14
		160	654.945	0.4	150	5.0	0.40	8.0	0.20	655.318	0.4	180	0.2	1.8	0.10
		200	654.935	0.2	100	4.0	0.30	7.0	0.15	655.319	0.2	100	0.2	1.8	0.06
		240	654.945	0.4	180	4.0	0.35	7.5	0.17	655.318	0.4	220	0.2	1.2	0.10
		280	654.935	0.2	140	3.5	0.30	6.0	0.15	655.319	0.2	240	0.2	1.2	0.06
		340	654.935	0.2	80	3.0	0.30	5.0	0.15	655.319	0.2	200	0.1	0.7	0.06
		400	654.935	0.2	40	3.0	0.25	5.0	0.15	655.369	0.1	150	0.1	0.7	0.04
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	100	654.955	0.8	200	5.5	0.45	9.0	0.22	655.320	0.8	320	0.2	2.2	0.14
		160	654.945	0.4	150	5.0	0.40	8.0	0.20	655.318	0.4	180	0.2	1.8	0.10
		200	654.935	0.2	100	4.0	0.30	7.0	0.15	655.319	0.2	100	0.2	1.8	0.06
		240	654.945	0.4	180	4.0	0.35	7.5	0.17	655.318	0.4	220	0.2	1.2	0.10
		280	654.935	0.2	140	3.5	0.30	6.0	0.15	655.319	0.2	220	0.2	1.2	0.06
		340	654.935	0.2	80	3.0	0.30	5.0	0.15	655.319	0.2	200	0.1	0.7	0.06
		400	654.935	0.2	40	3.0	0.25	4.5	0.15	655.369	0.1	150	0.1	0.7	0.04
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	100	654.955	0.8	180	5.5	0.45	8.5	0.22	655.320	0.8	280	0.2	2.2	0.14
		160	654.945	0.4	140	5.0	0.40	8.0	0.20	655.318	0.4	160	0.2	1.8	0.10
		200	654.935	0.2	100	4.0	0.30	6.0	0.15	655.319	0.2	100	0.2	1.8	0.06
		240	654.945	0.4	160	4.0	0.35	7.0	0.17	655.318	0.4	200	0.2	1.2	0.10
		280	654.935	0.2	120	3.5	0.30	6.0	0.15	655.319	0.2	200	0.2	1.2	0.06
		340	654.935	0.2	80	3.0	0.30	5.0	0.15	655.319	0.2	200	0.1	0.7	0.06
		400	654.935	0.2	40	3.0	0.25	4.5	0.15	655.369	0.1	150	0.1	0.7	0.04
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	100	654.952	0.8	240	9.0	0.45	15.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		160	654.942	0.4	160	8.0	0.40	13.0	0.25	655.302A	0.4	240	0.2	2.5	0.10
		200	654.935	0.2	100	6.0	0.30	10.0	0.20	655.301A	0.2	100	0.2	2.0	0.06
		240	654.942	0.4	200	7.0	0.35	12.0	0.20	655.302A	0.4	240	0.2	2.0	0.10
		280	654.935	0.2	140	6.0	0.30	10.0	0.15	655.301A	0.2	200	0.2	1.5	0.06
		340	654.935	0.2	80	5.0	0.30	8.0	0.15	655.301A	0.2	200	0.1	0.9	0.06
		400	654.935	0.2	40	4.0	0.30	7.0	0.15	655.363	0.1	150	0.1	0.9	0.04

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to use the balanceable fine boring heads, e.g. 309.401 or 310.405A and to balance the complete tool assembly.





	Workpiece material	Boring depth	Rough boring SW 41							Fine boring EW/EWB/EWE 41					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	100	654.952	0.8	220	9.0	0.45	15.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		160	654.942	0.4	160	8.0	0.40	13.0	0.25	655.380	0.4	240	0.2	2.0	0.10
		200	654.935	0.2	100	6.0	0.30	10.0	0.20	655.370	0.2	100	0.2	2.0	0.06
		240	654.942	0.4	200	7.0	0.35	12.0	0.20	655.380	0.4	240	0.2	1.5	0.10
		280	654.935	0.2	140	6.0	0.30	10.0	0.15	655.370	0.2	240	0.2	1.5	0.06
		340	654.935	0.2	80	5.0	0.30	8.0	0.15	655.370	0.2	200	0.1	0.9	0.06
		400	654.935	0.2	40	4.0	0.30	7.0	0.15	655.363	0.1	150	0.1	0.9	0.04
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	100	654.955	0.8	200	6.0	0.45	10.0	0.22	655.320	0.8	320	0.2	2.2	0.14
		160	654.945	0.4	150	5.5	0.40	9.0	0.20	655.318	0.4	180	0.2	1.8	0.10
		200	654.935	0.2	100	4.5	0.30	7.5	0.15	655.319	0.2	100	0.2	1.8	0.06
		240	654.945	0.4	180	5.0	0.35	8.0	0.17	655.318	0.4	220	0.2	1.2	0.10
		280	654.935	0.2	140	4.0	0.30	7.0	0.15	655.319	0.2	220	0.2	1.2	0.06
		340	654.935	0.2	80	3.5	0.30	6.0	0.15	655.319	0.2	200	0.1	0.7	0.06
		400	654.935	0.2	40	3.0	0.25	5.5	0.15	655.369	0.1	150	0.1	0.7	0.04
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	100	654.987	0.8	850	7.0	0.50	11.0	0.25	655.398	0.8	1000	0.2	2.5	0.14
		160	654.987	0.8	280	6.0	0.45	9.0	0.25	655.388	0.4	380	0.2	2.5	0.10
		200	654.977	0.4	200	5.0	0.35	7.5	0.20	655.378	0.2	180	0.2	2.5	0.06
		240	654.987	0.8	280	6.0	0.40	9.0	0.22	655.388	0.4	260	0.2	2.0	0.10
		280	654.977	0.4	200	5.0	0.35	7.5	0.17	655.378	0.2	240	0.2	2.0	0.06
		340	654.977	0.4	100	4.0	0.30	6.0	0.15	655.378	0.2	200	0.2	1.0	0.06
		400	654.977	0.4	60	4.0	0.30	6.0	0.15	655.363	0.1	150	0.2	1.0	0.04
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	100	654.959	0.8	650	7.0	0.50	11.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		160	654.959	0.8	280	6.0	0.45	9.0	0.25	655.318	0.4	380	0.2	2.5	0.10
		200	654.949	0.4	200	5.0	0.35	7.5	0.20	655.319	0.2	180	0.2	2.5	0.06
		240	654.959	0.8	280	6.0	0.40	9.0	0.22	655.318	0.4	260	0.2	2.0	0.10
		280	654.949	0.4	200	5.0	0.35	7.5	0.17	655.319	0.2	250	0.2	2.0	0.06
		340	654.949	0.4	100	4.0	0.30	6.0	0.15	655.319	0.2	200	0.2	1.0	0.06
		400	654.949	0.4	60	4.0	0.30	6.0	0.15	655.369	0.1	150	0.2	1.0	0.04
S	Titanium 3.7164	100	654.957	0.8	120	5.0	0.45	9.0	0.22	655.320	0.8	120	0.2	2.5	0.14
		160	654.947	0.4	120	4.5	0.40	8.0	0.20	655.318	0.4	120	0.2	2.0	0.10
		200	654.937	0.2	80	4.0	0.30	7.0	0.15	655.319	0.2	80	0.2	2.0	0.06
		240	654.947	0.4	100	4.0	0.35	7.5	0.17	655.318	0.4	120	0.2	1.5	0.10
		280	654.937	0.2	80	3.5	0.25	7.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		340	654.937	0.2	60	3.0	0.25	6.0	0.15	655.319	0.2	80	0.1	0.9	0.06
		400	654.937	0.2	40	3.0	0.25	5.0	0.15	655.369	0.1	70	0.1	0.9	0.04
	Ni-basic-, Co-basic-, Alloys	100	654.957	0.8	50	4.0	0.40	8.0	0.20	655.326	0.4	50	0.2	1.0	0.10
		160	654.947	0.4	50	3.5	0.35	7.0	0.17	655.326	0.4	50	0.2	1.0	0.10
		200	654.937	0.2	30	3.0	0.30	5.0	0.15	655.316	0.2	40	0.2	1.0	0.06
		240	654.937	0.2	40	3.5	0.30	6.0	0.15	655.326	0.4	50	0.1	0.8	0.10
		280	654.937	0.2	30	3.0	0.20	5.0	0.10	655.316	0.2	50	0.1	0.8	0.06
		340	654.937	0.2	30	3.0	0.20	4.0	0.10	655.316	0.2	40	0.1	0.6	0.06

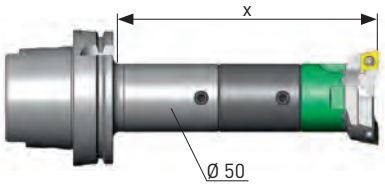
Remark:

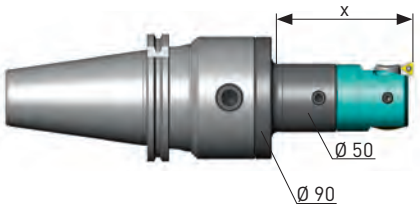
For a cost effective high volume production with boring depth X of 240 mm and deeper, carbide bars have to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.447 for the range Ø 53 - 66 mm
- Fine Boring: Insert holder size 2, 626.142, for the range Ø 50 - 63 mm, insert holder size 3, 626.143, for the range Ø 61 - 74 mm

The given cutting data are valid for insert holder size 1. When using insert holder size 2, the cutting data have to be reduced by 10%, and by 20% when using insert holder size 3.

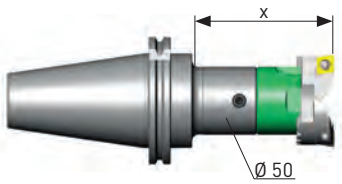




	Workpiece material	Boring depth	Rough boring SW 53							Fine boring EWN/EWB/EWE 53					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	100	654.990A	0.8	250	10.0	0.55	16.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		130	654.990A	0.8	250	10.0	0.55	16.0	0.30	655.334	0.8	320	0.2	2.5	0.14
		160	654.990A	0.8	200	8.0	0.55	13.0	0.30	655.324	0.4	200	0.2	2.5	0.10
		200	654.993A	0.4	125	6.0	0.35	10.0	0.20	655.324	0.4	150	0.2	2.0	0.10
		260	654.993A	0.4	40	5.0	0.35	8.0	0.20	655.375	0.2	240	0.2	1.5	0.06
		310	654.993A	0.4	80	5.0	0.35	8.0	0.20	655.375	0.2	200	0.2	1.0	0.06
		350	654.993A	0.4	80	5.0	0.35	8.0	0.20	655.375	0.2	150	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	100	654.990A	0.8	230	10.0	0.50	16.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		130	654.990A	0.8	230	10.0	0.50	16.0	0.25	655.334	0.8	320	0.2	2.5	0.14
		160	654.990A	0.8	200	8.0	0.50	13.0	0.25	655.324	0.4	200	0.2	2.5	0.10
		200	654.993A	0.4	125	6.0	0.30	10.0	0.15	655.324	0.4	150	0.2	2.0	0.10
		260	654.993A	0.4	40	5.0	0.30	8.0	0.15	655.375	0.2	240	0.2	1.5	0.06
		310	654.993A	0.4	80	5.0	0.30	8.0	0.15	655.375	0.2	200	0.2	1.0	0.06
		350	654.993A	0.4	80	5.0	0.30	8.0	0.15	655.375	0.2	150	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	100	654.965	0.8	200	9.0	0.50	15.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		130	654.965	0.8	200	9.0	0.50	15.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		160	654.965	0.8	180	7.5	0.50	12.0	0.25	655.318	0.4	200	0.2	2.0	0.10
		200	654.964	0.4	120	6.0	0.30	10.0	0.15	655.318	0.4	140	0.2	1.3	0.10
		260	654.964	0.4	40	5.0	0.30	8.0	0.15	655.319	0.2	240	0.2	1.3	0.06
		310	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		350	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	150	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	100	654.965	0.8	200	9.0	0.50	15.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		130	654.965	0.8	200	9.0	0.50	15.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		160	654.965	0.8	180	7.5	0.50	12.0	0.25	655.318	0.4	200	0.2	2.0	0.10
		200	654.964	0.4	120	6.0	0.30	10.0	0.15	655.318	0.4	140	0.2	1.3	0.10
		260	654.964	0.4	40	5.0	0.30	8.0	0.15	655.319	0.2	220	0.2	1.3	0.06
		310	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		350	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	150	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	100	654.965	0.8	160	9.0	0.50	15.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		130	654.965	0.8	160	9.0	0.50	15.0	0.25	655.320	0.8	280	0.2	2.0	0.14
		160	654.965	0.8	140	7.5	0.50	12.0	0.25	655.318	0.4	180	0.2	2.0	0.10
		200	654.964	0.4	120	6.0	0.30	10.0	0.15	655.318	0.4	120	0.2	1.3	0.10
		260	654.964	0.4	40	5.0	0.30	8.0	0.15	655.319	0.2	200	0.2	1.3	0.06
		310	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		350	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	150	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	100	654.991	0.8	250	14.0	0.55	22.0	0.30	655.303A	0.8	350	0.2	2.5	0.14
		130	654.991	0.8	250	14.0	0.55	22.0	0.30	655.303A	0.8	300	0.2	2.5	0.14
		160	654.991	0.8	200	12.0	0.55	18.0	0.30	655.302A	0.4	200	0.2	2.5	0.10
		200	654.989	0.4	125	9.0	0.35	15.0	0.20	655.302A	0.4	140	0.2	2.0	0.10
		260	654.989	0.4	40	7.0	0.35	10.0	0.20	655.302A	0.4	200	0.2	1.5	0.10
		310	654.989	0.4	80	7.0	0.35	10.0	0.20	655.301A	0.2	200	0.2	1.0	0.06
		350	654.989	0.4	80	7.0	0.35	10.0	0.20	655.301A	0.2	150	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to use the balanceable fine boring heads, e.g. 309.501 or 310.505A and to balance the complete tool assembly.



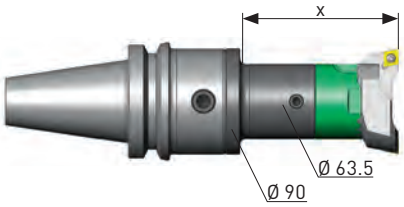
	Workpiece material	Boring depth	Rough boring SW 53							Fine boring EWN/EWB/EWE 53					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	100	654.991	0.8	220	14.0	0.55	22.0	0.30	655.390	0.8	350	0.2	2.5	0.14
		130	654.991	0.8	220	14.0	0.55	22.0	0.30	655.390	0.8	300	0.2	2.5	0.14
		160	654.991	0.8	200	12.0	0.55	18.0	0.30	655.380	0.4	200	0.2	2.5	0.10
		200	654.989	0.4	125	9.0	0.35	15.0	0.20	655.380	0.4	140	0.2	2.0	0.10
		260	654.989	0.4	40	7.0	0.35	10.0	0.20	655.370	0.2	240	0.2	1.5	0.06
		310	654.989	0.4	80	7.0	0.35	10.0	0.20	655.370	0.2	200	0.2	1.0	0.06
		350	654.989	0.4	80	7.0	0.35	10.0	0.20	655.370	0.2	150	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	100	654.965	0.8	200	10.0	0.50	16.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		130	654.965	0.8	200	10.0	0.50	16.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		160	654.965	0.8	180	8.0	0.50	13.0	0.25	655.318	0.4	200	0.2	2.0	0.10
		200	654.964	0.4	120	6.0	0.30	10.0	0.15	655.318	0.4	140	0.2	1.3	0.10
		260	654.964	0.4	40	5.0	0.30	8.0	0.15	655.319	0.2	220	0.2	1.3	0.06
		310	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		350	654.964	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	150	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	100	654.992	0.8	1000	12.0	0.55	18.0	0.30	655.398	0.8	1200	0.2	2.5	0.14
		130	654.992	0.8	750	12.0	0.55	18.0	0.30	655.398	0.8	750	0.2	2.5	0.14
		160	654.992	0.8	350	10.0	0.55	16.0	0.30	655.398	0.8	400	0.2	2.5	0.14
		200	654.992	0.8	200	8.0	0.55	14.0	0.30	655.388	0.4	220	0.2	2.5	0.10
		260	654.995	0.4	70	7.0	0.35	10.0	0.20	655.388	0.4	240	0.2	2.0	0.10
		310	654.995	0.4	100	7.0	0.35	10.0	0.20	655.378	0.2	200	0.2	1.5	0.06
		350	654.995	0.4	100	7.0	0.35	10.0	0.20	655.378	0.2	150	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	100	654.979	0.8	650	12.0	0.55	18.0	0.30	655.320	0.8	650	0.2	2.5	0.14
		130	654.979	0.8	650	12.0	0.55	18.0	0.30	655.320	0.8	650	0.2	2.5	0.14
		160	654.979	0.8	350	10.0	0.55	16.0	0.30	655.320	0.8	400	0.2	2.5	0.14
		200	654.979	0.8	200	8.0	0.55	14.0	0.30	655.318	0.4	220	0.2	2.5	0.10
		260	654.978	0.4	70	7.0	0.35	10.0	0.20	655.318	0.4	250	0.2	2.0	0.10
		310	654.978	0.4	100	7.0	0.35	10.0	0.20	655.319	0.2	200	0.2	1.5	0.06
		350	654.978	0.4	100	7.0	0.35	10.0	0.20	655.319	0.2	150	0.2	1.5	0.06
S	Titanium 3.7164	100	654.969	0.8	120	9.0	0.50	15.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		130	654.969	0.8	120	9.0	0.50	15.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		160	654.968	0.4	120	7.0	0.30	12.0	0.15	655.318	0.4	100	0.2	2.5	0.10
		200	654.968	0.4	100	6.0	0.30	10.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		260	654.968	0.4	80	5.0	0.30	8.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		310	654.968	0.4	60	5.0	0.30	8.0	0.15	655.319	0.2	80	0.2	1.0	0.06
		350	654.968	0.4	60	5.0	0.30	8.0	0.15	655.319	0.2	70	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	100	654.969	0.8	50	7.0	0.50	12.0	0.25	655.326	0.4	50	0.2	1.0	0.10
		130	654.969	0.8	50	7.0	0.50	12.0	0.25	655.326	0.4	50	0.2	1.0	0.10
		160	654.968	0.4	40	5.0	0.30	8.0	0.15	655.326	0.4	40	0.2	1.0	0.10
		200	654.968	0.4	40	4.0	0.30	7.0	0.15	655.316	0.2	30	0.1	0.8	0.06
		260	654.968	0.4	30	3.0	0.30	5.0	0.15	655.316	0.2	50	0.1	0.8	0.06
		310	654.968	0.4	30	3.0	0.30	5.0	0.15	655.316	0.2	40	0.1	0.6	0.06

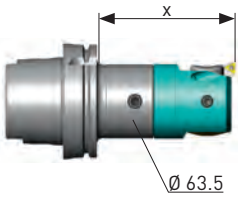
Remark:

For boring depths X ≥ 310 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.457 for the range Ø 69 - 86 mm
- Fine Boring: Insert holder size 2, 626.152, for the range Ø 65 - 82 mm, insert holder size 3, 626.153, for the range Ø 78 - 95 mm



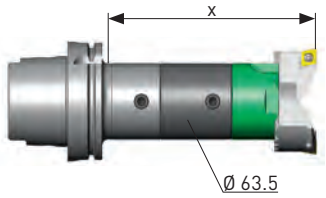


	Workpiece material	Boring depth	Rough boring SW 68							Fine boring EWN/EWB/EWE 68					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	100	654.990A	0.8	250	13.0	0.55	21.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		160	654.990A	0.8	250	12.0	0.55	19.0	0.30	655.334	0.8	400	0.2	2.5	0.14
		200	654.990A	0.8	230	11.0	0.55	17.0	0.30	655.334	0.8	250	0.2	2.5	0.14
		260	654.993A	0.4	160	9.0	0.35	14.0	0.20	655.324	0.4	180	0.2	2.0	0.10
		320	654.993A	0.4	60	7.0	0.35	12.0	0.20	655.375	0.2	80	0.2	1.5	0.06
		340	654.993A	0.4	150	7.0	0.35	12.0	0.20	655.375	0.2	200	0.2	1.0	0.06
		400	654.993A	0.4	120	7.0	0.35	12.0	0.20	655.375	0.2	150	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	100	654.990A	0.8	230	13.0	0.50	21.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		160	654.990A	0.8	230	12.0	0.50	19.0	0.25	655.334	0.8	400	0.2	2.5	0.14
		200	654.990A	0.8	210	11.0	0.50	17.0	0.25	655.334	0.8	250	0.2	2.5	0.14
		260	654.993A	0.4	160	9.0	0.30	14.0	0.15	655.324	0.4	180	0.2	2.0	0.10
		320	654.993A	0.4	60	7.0	0.30	12.0	0.15	655.375	0.2	80	0.2	1.5	0.06
		340	654.993A	0.4	150	7.0	0.30	12.0	0.15	655.375	0.2	200	0.2	1.0	0.06
		400	654.993A	0.4	120	7.0	0.30	12.0	0.15	655.375	0.2	150	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	100	654.965	0.8	210	12.0	0.50	20.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		160	654.965	0.8	210	11.0	0.50	18.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		200	654.965	0.8	200	10.0	0.50	16.0	0.25	655.320	0.8	240	0.2	2.0	0.14
		260	654.964	0.4	140	8.0	0.30	13.0	0.15	655.318	0.4	160	0.2	1.8	0.10
		320	654.964	0.4	60	6.0	0.30	10.0	0.15	655.319	0.2	80	0.2	1.3	0.06
		340	654.964	0.4	150	6.0	0.30	10.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		400	654.964	0.4	120	6.0	0.30	10.0	0.15	655.319	0.2	150	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	100	654.965	0.8	210	12.0	0.50	20.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		160	654.965	0.8	210	11.0	0.50	18.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		200	654.965	0.8	200	10.0	0.50	16.0	0.25	655.320	0.8	240	0.2	2.0	0.14
		260	654.964	0.4	140	8.0	0.30	13.0	0.15	655.318	0.4	160	0.2	1.8	0.10
		320	654.964	0.4	60	6.0	0.30	10.0	0.15	655.319	0.2	80	0.2	1.3	0.06
		340	654.964	0.4	150	6.0	0.30	10.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		400	654.964	0.4	120	6.0	0.30	10.0	0.15	655.319	0.2	150	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	100	654.965	0.8	180	12.0	0.50	20.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		160	654.965	0.8	180	11.0	0.50	18.0	0.25	655.320	0.8	250	0.2	2.0	0.14
		200	654.965	0.8	160	10.0	0.50	16.0	0.25	655.320	0.8	220	0.2	2.0	0.14
		260	654.964	0.4	140	8.0	0.30	13.0	0.15	655.318	0.4	160	0.2	1.8	0.10
		320	654.964	0.4	60	6.0	0.30	10.0	0.15	655.319	0.2	80	0.2	1.3	0.06
		340	654.964	0.4	150	6.0	0.30	10.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		400	654.964	0.4	100	6.0	0.30	10.0	0.15	655.319	0.2	150	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	100	654.991	0.8	250	18.0	0.55	26.0	0.30	655.303A	0.8	350	0.2	2.5	0.14
		160	654.991	0.8	250	16.0	0.55	24.0	0.30	655.303A	0.8	350	0.2	2.5	0.14
		200	654.991	0.8	230	15.0	0.55	22.0	0.30	655.303A	0.8	250	0.2	2.5	0.14
		260	654.989	0.4	160	12.0	0.35	18.0	0.20	655.302A	0.4	160	0.2	2.0	0.10
		320	654.989	0.4	60	9.0	0.35	14.0	0.20	655.301A	0.2	80	0.2	1.5	0.06
		340	654.989	0.4	150	9.0	0.35	14.0	0.20	655.301A	0.2	200	0.2	1.0	0.06
		400	654.989	0.4	100	9.0	0.35	14.0	0.20	655.301A	0.2	150	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min, we recommend to use the balanceable fine boring heads, e.g. 309.601 or 310.605A and to balance the complete tool assembly.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.



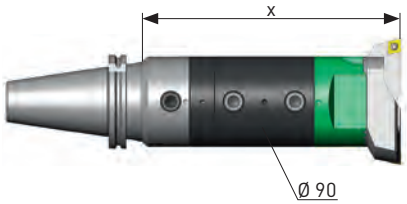
	Workpiece material	Boring depth	Rough boring SW 68							Fine boring EWN/EWB/EWE 68					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	100	654.991	0.8	230	18.0	0.55	26.0	0.30	655.390	0.8	350	0.2	2.5	0.14
		160	654.991	0.8	230	16.0	0.55	24.0	0.30	655.390	0.8	350	0.2	2.5	0.14
		200	654.991	0.8	210	15.0	0.55	22.0	0.30	655.390	0.8	250	0.2	2.5	0.14
		260	654.989	0.4	160	12.0	0.35	18.0	0.20	655.380	0.4	160	0.2	2.0	0.10
		320	654.989	0.4	60	9.0	0.35	14.0	0.20	655.370	0.2	80	0.2	1.5	0.06
		340	654.989	0.4	210	9.0	0.35	14.0	0.20	655.370	0.2	200	0.2	1.0	0.06
		400	654.989	0.4	150	9.0	0.35	14.0	0.20	655.370	0.2	150	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	100	654.965	0.8	200	12.0	0.50	20.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		160	654.965	0.8	200	11.0	0.50	18.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		200	654.965	0.8	180	10.0	0.50	16.0	0.25	655.320	0.8	240	0.2	2.0	0.14
		260	654.964	0.4	160	8.0	0.30	13.0	0.15	655.318	0.4	160	0.2	2.0	0.10
		320	654.964	0.4	60	6.0	0.30	10.0	0.15	655.319	0.2	80	0.2	1.3	0.06
		340	654.964	0.4	180	6.0	0.30	10.0	0.15	655.319	0.2	200	0.2	0.8	0.06
		400	654.964	0.4	150	6.0	0.30	10.0	0.15	655.319	0.2	150	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	100	654.992	0.8	900	15.0	0.55	24.0	0.30	655.398	0.8	1200	0.2	2.5	0.14
		160	654.992	0.8	750	14.0	0.55	22.0	0.30	655.398	0.8	750	0.2	2.5	0.14
		200	654.992	0.8	350	12.0	0.55	20.0	0.30	655.398	0.8	350	0.2	2.5	0.14
		260	654.992	0.8	250	10.0	0.55	16.0	0.30	655.388	0.4	250	0.2	2.5	0.10
		320	654.995	0.4	100	8.0	0.35	14.0	0.20	655.378	0.2	100	0.2	2.5	0.06
		340	654.995	0.4	300	8.0	0.35	14.0	0.20	655.378	0.2	300	0.2	2.0	0.06
		400	654.995	0.4	250	8.0	0.35	14.0	0.20	655.378	0.2	250	0.2	2.0	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	100	654.979	0.8	650	15.0	0.55	24.0	0.30	655.320	0.8	650	0.2	2.5	0.14
		160	654.979	0.8	650	14.0	0.55	22.0	0.30	655.320	0.8	650	0.2	2.5	0.14
		200	654.979	0.8	350	12.0	0.55	20.0	0.30	655.320	0.8	350	0.2	2.5	0.14
		260	654.979	0.8	250	10.0	0.55	16.0	0.30	655.318	0.4	250	0.2	2.5	0.10
		320	654.978	0.4	100	8.0	0.35	14.0	0.20	655.319	0.2	100	0.2	2.5	0.06
		340	654.978	0.4	300	8.0	0.35	14.0	0.20	655.319	0.2	300	0.2	2.0	0.06
		400	654.978	0.4	200	8.0	0.35	14.0	0.20	655.319	0.2	250	0.2	2.0	0.06
S	Titanium 3.7164	100	654.969	0.8	120	12.0	0.50	20.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		160	654.969	0.8	120	11.0	0.50	18.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		200	654.969	0.8	120	10.0	0.50	16.0	0.25	655.318	0.4	100	0.2	2.5	0.10
		260	654.968	0.4	100	8.0	0.30	13.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		320	654.968	0.4	80	6.0	0.30	10.0	0.15	655.319	0.2	70	0.2	1.5	0.06
		340	654.968	0.4	100	6.0	0.30	10.0	0.15	655.319	0.2	100	0.2	1.0	0.06
		400	654.968	0.4	80	6.0	0.30	10.0	0.15	655.319	0.2	80	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	100	654.969	0.8	50	10.0	0.40	16.0	0.20	655.326	0.4	50	0.2	1.5	0.10
		160	654.969	0.8	50	9.0	0.40	14.0	0.20	655.326	0.4	50	0.2	1.5	0.10
		200	654.968	0.4	40	8.0	0.25	12.0	0.12	655.326	0.4	40	0.2	1.5	0.10
		260	654.968	0.4	40	6.0	0.25	10.0	0.12	655.316	0.2	30	0.1	1.0	0.06
		320	654.968	0.4	50	5.0	0.25	8.0	0.12	655.316	0.2	50	0.1	0.8	0.06
		340	654.968	0.4	40	5.0	0.25	8.0	0.12	655.316	0.2	40	0.1	0.6	0.06

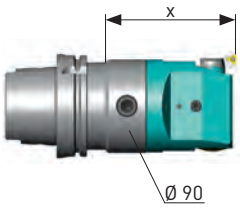
Remark:

For boring depths X ≥ 340 mm the anti-vibration extension Smart Damper has to be used.

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holders 639.467 for the range Ø 88 - 110 mm
- Fine Boring: Insert holder size 2, 626.162, for the range Ø 94 - 126 mm, insert holder size 3, 626.163, for the range Ø 118 - 150 mm



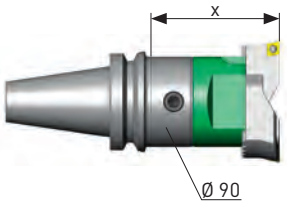


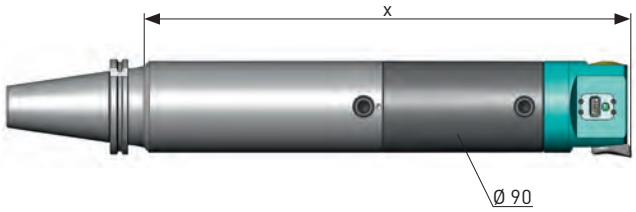
	Workpiece material	Boring depth	Rough boring SW 98							Fine boring EWN/EWB/EWE 100					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	160	654.990A	0.8	250	16.0	0.60	25.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	250	14.0	0.60	24.0	0.30	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	250	13.0	0.60	22.0	0.30	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	12.0	0.60	20.0	0.30	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	11.0	0.40	18.0	0.20	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	10.0	0.40	15.0	0.20	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	9.0	0.40	13.0	0.20	655.375	0.2	40	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	160	654.990A	0.8	230	16.0	0.55	25.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	230	14.0	0.55	24.0	0.25	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	230	13.0	0.55	22.0	0.25	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	12.0	0.55	20.0	0.25	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	11.0	0.35	18.0	0.15	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	10.0	0.35	15.0	0.15	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	9.0	0.35	13.0	0.15	655.375	0.2	40	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	160	654.965	0.8	210	15.0	0.55	24.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	160	654.965	0.8	210	15.0	0.55	24.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	160	654.965	0.8	180	15.0	0.55	24.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		260	654.965	0.8	180	13.0	0.55	22.0	0.25	655.320	0.8	250	0.2	2.0	0.14
		320	654.965	0.8	180	12.0	0.55	20.0	0.25	655.318	0.4	220	0.2	2.0	0.10
		370	654.965	0.8	140	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	160	654.991	0.8	250	20.0	0.55	30.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	250	20.0	0.55	28.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	250	20.0	0.55	26.0	0.25	655.303A	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	16.0	0.55	24.0	0.25	655.302A	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.0	0.15	655.301A	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.301A	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.301A	0.2	40	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min we recommend to use the balanceable fine boring head 310.705.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.

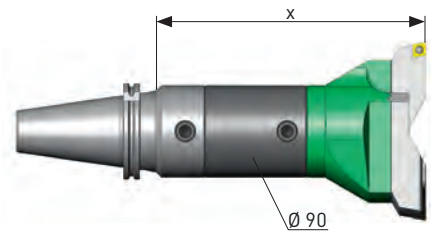


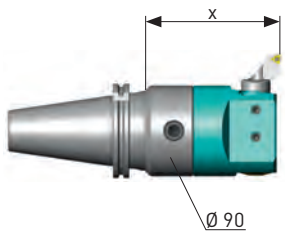


Workpiece material		Boring depth	Rough boring SW 98							Fine boring EWN/EWB/EWE 100					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	160	654.991	0.8	230	20.0	0.55	30.00	0.25	655.390	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	230	20.0	0.55	28.00	0.25	655.390	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	230	20.0	0.55	26.00	0.25	655.390	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	16.0	0.55	24.00	0.25	655.380	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.00	0.15	655.370	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.00	0.15	655.370	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.00	0.15	655.370	0.2	40	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	160	654.965	0.8	210	15.0	0.55	24.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.00	0.25	655.320	0.8	320	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.00	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.00	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.00	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.00	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.00	0.15	655.319	0.2	40	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	160	654.992	0.8	900	18.0	0.55	28.00	0.25	655.398	0.8	1200	0.2	2.5	0.14
		260	654.992	0.8	750	17.0	0.55	27.00	0.25	655.398	0.8	750	0.2	2.5	0.14
		320	654.992	0.8	400	16.0	0.55	25.00	0.25	655.398	0.8	400	0.2	2.5	0.14
		370	654.992	0.8	300	15.0	0.55	22.00	0.25	655.398	0.8	300	0.2	2.5	0.14
		420	654.992	0.8	180	14.0	0.55	20.00	0.25	655.388	0.4	180	0.2	2.0	0.10
		470	654.995	0.4	100	12.0	0.35	18.00	0.15	655.378	0.2	100	0.2	1.5	0.06
		520	654.995	0.4	70	10.0	0.35	16.00	0.15	655.378	0.2	70	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	160	654.979	0.8	650	18.0	0.55	28.00	0.25	655.320	0.8	650	0.2	2.5	0.14
		260	654.979	0.8	650	17.0	0.55	27.00	0.25	655.320	0.8	650	0.2	2.5	0.14
		320	654.979	0.8	400	16.0	0.55	25.00	0.25	655.320	0.8	400	0.2	2.5	0.14
		370	654.979	0.8	300	15.0	0.55	22.00	0.25	655.318	0.4	300	0.2	2.5	0.10
		420	654.978	0.4	180	14.0	0.35	20.00	0.15	655.319	0.2	180	0.2	2.0	0.06
		470	654.978	0.4	100	12.0	0.35	18.00	0.15	655.319	0.2	100	0.2	1.5	0.06
		520	654.978	0.4	70	10.0	0.35	16.00	0.15	655.319	0.2	70	0.2	1.5	0.06
S	Titanium 3.7164	160	654.969	0.8	120	15.0	0.55	24.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		260	654.969	0.8	120	13.0	0.55	22.00	0.25	655.320	0.8	120	0.2	2.5	0.14
		320	654.969	0.8	120	12.0	0.55	20.00	0.25	655.318	0.4	100	0.2	2.5	0.10
		370	654.968	0.4	100	11.0	0.35	18.00	0.15	655.318	0.4	80	0.2	2.0	0.10
		420	654.968	0.4	80	10.0	0.35	15.00	0.15	655.319	0.2	70	0.2	1.5	0.06
		470	654.968	0.4	60	9.0	0.35	13.00	0.15	655.319	0.2	60	0.2	1.0	0.06
		520	654.968	0.4	60	8.0	0.35	12.00	0.15	655.319	0.2	40	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	160	654.969	0.8	50	12.0	0.40	18.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		260	654.969	0.8	50	11.0	0.40	18.00	0.20	655.326	0.4	50	0.2	1.5	0.10
		320	654.968	0.4	40	10.0	0.25	16.00	0.15	655.326	0.4	40	0.2	1.5	0.10
		370	654.968	0.4	40	8.0	0.25	12.00	0.15	655.316	0.2	30	0.1	1.0	0.06
		420	654.968	0.4	30	6.0	0.25	10.00	0.15	655.316	0.2	30	0.1	0.8	0.06
		470	654.968	0.4	30	6.0	0.25	10.00	0.15	655.316	0.2	30	0.1	0.6	0.06

Extension of the boring range with additional insert holders:

- Rough boring: Pair of insert holderse 639.477 for the range Ø 125 - 153 mm
- Fine Boring: Insert holder size 2, 626.162, for the range Ø 126 - 179 mm, insert holder size 3, 626.163, for the range Ø 150 - 203 mm



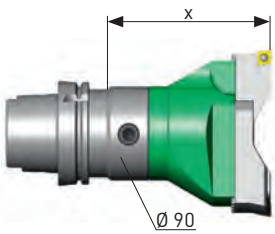


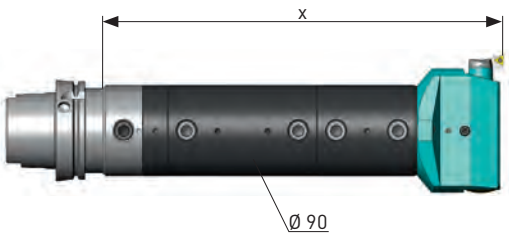
	Workpiece material	Boring depth	Rough boring SW 148							Fine boring EWN/EWE 100, EWB 150					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	160	654.990A	0.8	250	16.0	0.60	25.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	250	14.0	0.60	24.0	0.30	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	250	13.0	0.60	22.0	0.30	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	12.0	0.60	20.0	0.30	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	11.0	0.40	18.0	0.20	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	10.0	0.40	15.0	0.20	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	9.0	0.40	13.0	0.20	655.375	0.2	40	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	160	654.990A	0.8	230	16.0	0.55	25.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	230	14.0	0.55	24.0	0.25	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	230	13.0	0.55	22.0	0.25	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	12.0	0.55	20.0	0.25	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	11.0	0.35	18.0	0.15	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	10.0	0.35	15.0	0.15	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	9.0	0.35	13.0	0.15	655.375	0.2	40	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	160	654.965	0.8	210	15.0	0.55	24.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	160	654.965	0.8	210	15.0	0.55	24.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	160	654.965	0.8	180	15.0	0.55	24.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		260	654.965	0.8	180	13.0	0.55	22.0	0.25	655.320	0.8	250	0.2	2.0	0.14
		320	654.965	0.8	180	12.0	0.55	20.0	0.25	655.318	0.4	220	0.2	2.0	0.10
		370	654.965	0.8	140	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	160	654.991	0.8	250	20.0	0.55	30.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	250	20.0	0.55	28.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	250	20.0	0.55	26.0	0.25	655.303A	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	16.0	0.55	24.0	0.25	655.302A	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.0	0.15	655.301A	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.301A	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.301A	0.2	40	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min we recommend to use the balanceable fine boring head 310.706.

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.



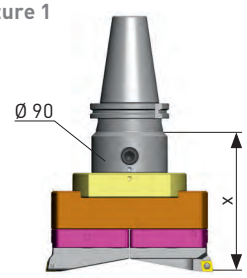


	Workpiece material	Boring depth	Rough boring SW 148							Fine boring EWN/EWE 100, EWB 150					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	160	654.991	0.8	230	20.0	0.55	30.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	230	20.0	0.55	28.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	230	20.0	0.55	26.0	0.25	655.390	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	16.0	0.55	24.0	0.25	655.380	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.0	0.15	655.370	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.370	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.370	0.2	40	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	160	654.965	0.8	210	15.0	0.55	24.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		260	654.965	0.8	210	13.0	0.55	22.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		320	654.965	0.8	210	12.0	0.55	20.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	11.0	0.55	18.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	10.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	160	654.992	0.8	900	18.0	0.55	28.0	0.25	655.398	0.8	1200	0.2	2.5	0.14
		260	654.992	0.8	750	17.0	0.55	27.0	0.25	655.398	0.8	750	0.2	2.5	0.14
		320	654.992	0.8	400	16.0	0.55	25.0	0.25	655.398	0.8	400	0.2	2.5	0.14
		370	654.992	0.8	300	15.0	0.55	22.0	0.25	655.398	0.8	300	0.2	2.5	0.14
		420	654.992	0.8	180	14.0	0.55	20.0	0.25	655.388	0.4	180	0.2	2.0	0.10
		470	654.995	0.4	100	12.0	0.35	18.0	0.15	655.378	0.2	100	0.2	1.5	0.06
		520	654.995	0.4	70	10.0	0.35	16.0	0.15	655.378	0.2	70	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	160	654.979	0.8	650	18.0	0.55	28.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		260	654.979	0.8	650	17.0	0.55	27.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		320	654.979	0.8	400	16.0	0.55	25.0	0.25	655.320	0.8	400	0.2	2.5	0.14
		370	654.979	0.8	300	15.0	0.55	22.0	0.25	655.318	0.4	300	0.2	2.5	0.10
		420	654.978	0.4	180	14.0	0.35	20.0	0.15	655.319	0.2	180	0.2	2.0	0.06
		470	654.978	0.4	100	12.0	0.35	18.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		520	654.978	0.4	70	10.0	0.35	16.0	0.15	655.319	0.2	70	0.2	1.5	0.06
S	Titanium 3.7164	160	654.969	0.8	120	15.0	0.55	24.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		260	654.969	0.8	120	13.0	0.55	22.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		320	654.969	0.8	120	12.0	0.55	20.0	0.25	655.318	0.4	100	0.2	2.5	0.10
		370	654.968	0.4	100	11.0	0.35	18.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		420	654.968	0.4	80	10.0	0.35	15.0	0.15	655.319	0.2	70	0.2	1.5	0.06
		470	654.968	0.4	60	9.0	0.35	13.0	0.15	655.319	0.2	60	0.2	1.0	0.06
		520	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	160	654.969	0.8	50	12.0	0.40	18.0	0.20	655.326	0.4	50	0.2	1.5	0.10
		260	654.969	0.8	50	11.0	0.40	18.0	0.20	655.326	0.4	50	0.2	1.5	0.10
		320	654.968	0.4	40	10.0	0.25	16.0	0.15	655.326	0.4	40	0.2	1.5	0.10
		370	654.968	0.4	40	8.0	0.25	12.0	0.15	655.316	0.2	30	0.1	1.0	0.06
		420	654.968	0.4	30	6.0	0.25	10.0	0.15	655.316	0.2	30	0.1	0.8	0.06
		470	654.968	0.4	30	6.0	0.25	10.0	0.15	655.316	0.2	30	0.1	0.6	0.06

Extension of the boring range with additional insert holders:

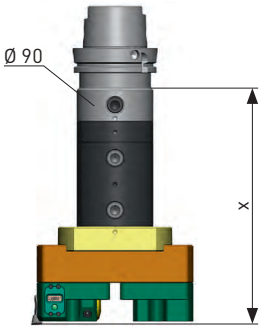
- Rough boring: Pair of insert holders 639.487 for the range Ø 175 - 203 mm
- Fine Boring: Insert holder size 3, 626.163, for the range Ø 150 - 203 mm

Picture 1



RSS

Picture 2



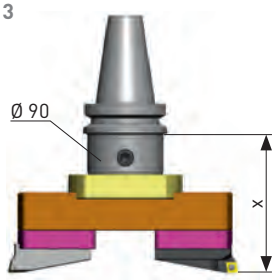
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	160	654.990A	0.8	250	14.0	0.60	22.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	250	12.0	0.60	20.0	0.30	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	250	10.0	0.60	18.0	0.30	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	9.0	0.60	16.0	0.30	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	9.0	0.40	16.0	0.20	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.40	14.0	0.20	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.40	14.0	0.20	655.375	0.2	40	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	160	654.990A	0.8	230	14.0	0.55	22.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	230	12.0	0.55	20.0	0.25	655.334	0.8	400	0.2	2.5	0.14
		320	654.990A	0.8	230	10.0	0.55	18.0	0.25	655.334	0.8	250	0.2	2.5	0.14
		370	654.990A	0.8	180	9.0	0.55	16.0	0.25	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	9.0	0.35	16.0	0.15	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.35	14.0	0.15	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.35	14.0	0.15	655.375	0.2	40	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	160	654.965	0.8	210	13.0	0.55	20.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	11.0	0.55	19.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	10.0	0.55	17.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	9.0	0.55	15.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	9.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	160	654.965	0.8	210	13.0	0.55	20.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.965	0.8	210	11.0	0.55	19.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		320	654.965	0.8	210	10.0	0.55	17.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	9.0	0.55	15.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	9.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	160	654.965	0.8	180	13.0	0.55	20.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		260	654.965	0.8	180	11.0	0.55	19.0	0.25	655.320	0.8	250	0.2	2.0	0.14
		320	654.965	0.8	180	10.0	0.55	17.0	0.25	655.318	0.4	220	0.2	2.0	0.10
		370	654.965	0.8	140	9.0	0.55	15.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	9.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	160	654.991	0.8	250	18.0	0.55	26.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	250	18.0	0.55	26.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	250	16.0	0.55	24.0	0.25	655.303A	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	14.0	0.55	22.0	0.25	655.302A	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.0	0.15	655.301A	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.301A	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.301A	0.2	40	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For cutting speeds above 400 m/min we recommend to use the counter weight 318.105 and to balance it according to the table (see operating instructions).

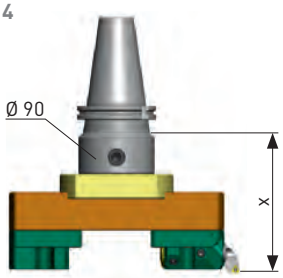
The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.

Picture 3



DVS

Picture 4



	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	160	654.991	0.8	230	18.0	0.55	26.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	230	18.0	0.55	26.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		320	654.991	0.8	230	16.0	0.55	24.0	0.25	655.390	0.8	250	0.2	2.5	0.14
		370	654.991	0.8	180	14.0	0.55	22.0	0.25	655.380	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	14.0	0.35	22.0	0.15	655.370	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.370	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.370	0.2	40	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	160	654.965	0.8	210	13.0	0.55	20.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		260	654.965	0.8	210	11.0	0.55	19.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		320	654.965	0.8	210	10.0	0.55	17.0	0.25	655.318	0.4	240	0.2	2.0	0.10
		370	654.965	0.8	180	9.0	0.55	15.0	0.25	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	9.0	0.35	15.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	160	654.992	0.8	900	18.0	0.55	26.0	0.25	655.398	0.8	1200	0.2	2.5	0.14
		260	654.992	0.8	750	17.0	0.55	25.0	0.25	655.398	0.8	750	0.2	2.5	0.14
		320	654.992	0.8	400	16.0	0.55	24.0	0.25	655.398	0.8	400	0.2	2.5	0.14
		370	654.992	0.8	300	15.0	0.55	22.0	0.25	655.398	0.8	300	0.2	2.5	0.14
		420	654.992	0.8	180	14.0	0.55	20.0	0.25	655.388	0.4	180	0.2	2.0	0.10
		470	654.995	0.4	100	12.0	0.35	18.0	0.15	655.378	0.2	100	0.2	1.5	0.06
		520	654.995	0.4	70	10.0	0.35	16.0	0.15	655.378	0.2	70	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	160	654.979	0.8	650	18.0	0.55	26.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		260	654.979	0.8	650	17.0	0.55	25.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		320	654.979	0.8	400	16.0	0.55	24.0	0.25	655.320	0.8	400	0.2	2.5	0.14
		370	654.979	0.8	300	15.0	0.55	22.0	0.25	655.318	0.4	300	0.2	2.5	0.10
		420	654.978	0.4	180	14.0	0.35	20.0	0.15	655.319	0.2	180	0.2	2.0	0.06
		470	654.978	0.4	100	12.0	0.35	18.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		520	654.978	0.4	70	10.0	0.35	16.0	0.15	655.319	0.2	70	0.2	1.5	0.06
S	Titanium 3.7164	160	654.969	0.8	120	13.0	0.55	20.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		260	654.969	0.8	120	11.0	0.55	19.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		320	654.969	0.8	120	10.0	0.55	17.0	0.25	655.318	0.4	100	0.2	2.5	0.10
		370	654.968	0.4	100	9.0	0.35	15.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		420	654.968	0.4	80	9.0	0.35	15.0	0.15	655.319	0.2	70	0.2	1.5	0.06
		470	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	1.0	0.06
		520	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	160	654.969	0.8	50	10.0	0.40	16.0	0.2	655.326	0.4	50	0.2	1.5	0.10
		260	654.969	0.8	50	10.0	0.40	16.0	0.2	655.326	0.4	50	0.2	1.5	0.10
		320	654.968	0.4	40	8.0	0.25	14.0	0.15	655.326	0.4	40	0.2	1.5	0.10
		370	654.968	0.4	40	8.0	0.25	10.0	0.15	655.316	0.2	30	0.1	1.0	0.06
		420	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.8	0.06
		470	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.6	0.06

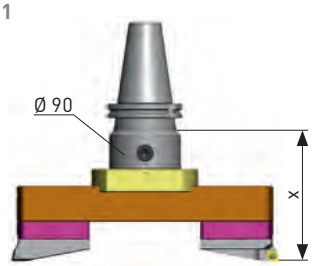
DVS rough boring

For double offset rough boring "DVS" a longer insert holder 637.951 / CC12 or 637.953 / CC16 has to be mounted on one side of the tool assembly. The longer insert holders are coloured black.

Extension slides: Ø 200- 270 mm (picture 1+2), extension slides 318.222 / Ø 270 - 340 mm (picture 3+4), extension slides 318.223

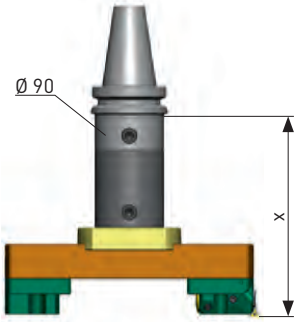
Extension of the boring range for fine boring with additional insert holders: With insert holder size 2, 626.272 the boring range can be extended by 25 mm/Ø, and with insert holder size 3, 626.273 by 50 mm/Ø.

Picture 1



RSS

Picture 2



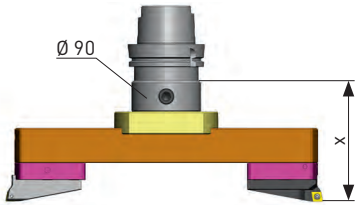
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	160	654.990A	0.8	250	12.0	0.60	20.0	0.30	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	250	10.0	0.60	18.0	0.30	655.334	0.8	400	0.2	2.5	0.14
		320	654.993A	0.4	250	9.0	0.40	16.0	0.20	655.324	0.4	250	0.2	2.5	0.10
		370	654.993A	0.4	180	9.0	0.40	16.0	0.20	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	8.0	0.40	14.0	0.20	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.40	14.0	0.20	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.40	14.0	0.20	655.375	0.2	40	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	160	654.990A	0.8	230	12.0	0.55	20.0	0.25	655.334	0.8	450	0.2	2.5	0.14
		260	654.990A	0.8	230	10.0	0.55	18.0	0.25	655.334	0.8	400	0.2	2.5	0.14
		320	654.993A	0.4	230	9.0	0.35	16.0	0.15	655.324	0.4	250	0.2	2.5	0.10
		370	654.993A	0.4	180	9.0	0.35	16.0	0.15	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	8.0	0.35	14.0	0.15	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.35	14.0	0.15	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.35	14.0	0.15	655.375	0.2	40	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	160	654.965	0.8	210	11.0	0.55	18.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	300	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	160	654.965	0.8	210	11.0	0.55	18.0	0.25	655.320	0.8	350	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	300	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	160	654.965	0.8	180	11.0	0.55	18.0	0.25	655.320	0.8	300	0.2	2.0	0.14
		260	654.964	0.4	180	10.0	0.35	17.0	0.15	655.320	0.8	250	0.2	2.0	0.14
		320	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	220	0.2	2.0	0.10
		370	654.964	0.4	140	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	160	654.991	0.8	250	16.0	0.55	23.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	250	15.0	0.55	23.0	0.25	655.303A	0.8	350	0.2	2.5	0.14
		320	654.989	0.4	250	14.0	0.35	22.0	0.15	655.303A	0.8	250	0.2	2.5	0.14
		370	654.989	0.4	180	14.0	0.35	22.0	0.15	655.302A	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	12.0	0.35	20.0	0.15	655.301A	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.301A	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.301A	0.2	40	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

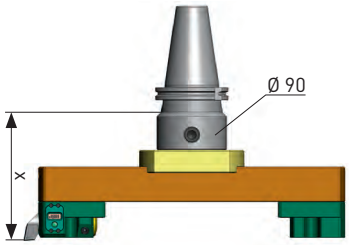
For cutting speeds above 400 m/min we recommend to use the counter weight 318.105 and to balance it according to the table (see operating instructions).

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.

Picture 3



Picture 4



DVS

	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	160	654.991	0.8	230	16.0	0.55	23.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		260	654.991	0.8	230	15.0	0.55	23.0	0.25	655.390	0.8	350	0.2	2.5	0.14
		320	654.989	0.4	230	14.0	0.35	22.0	0.15	655.380	0.4	250	0.2	2.5	0.10
		370	654.989	0.4	180	14.0	0.35	22.0	0.15	655.380	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	12.0	0.35	20.0	0.15	655.370	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.370	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.370	0.2	40	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	160	654.965	0.8	210	11.0	0.55	18.0	0.25	655.320	0.8	320	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	320	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	160	654.992	0.8	900	16.0	0.55	23.0	0.25	655.398	0.8	1200	0.2	2.5	0.14
		260	654.992	0.8	750	15.0	0.55	22.0	0.25	655.398	0.8	750	0.2	2.5	0.14
		320	654.992	0.8	400	15.0	0.55	22.0	0.25	655.398	0.8	400	0.2	2.5	0.14
		370	654.995	0.4	300	14.0	0.35	20.0	0.15	655.388	0.4	300	0.2	2.5	0.10
		420	654.995	0.4	180	14.0	0.35	20.0	0.15	655.388	0.4	180	0.2	2.0	0.10
		470	654.995	0.4	100	12.0	0.35	18.0	0.15	655.378	0.2	100	0.2	1.5	0.06
		520	654.995	0.4	70	10.0	0.35	16.0	0.15	655.378	0.2	70	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	160	654.979	0.8	650	16.0	0.55	23.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		260	654.979	0.8	650	15.0	0.55	22.0	0.25	655.320	0.8	650	0.2	2.5	0.14
		320	654.978	0.4	400	15.0	0.35	22.0	0.15	655.318	0.4	400	0.2	2.5	0.10
		370	654.978	0.4	300	14.0	0.35	20.0	0.15	655.318	0.4	300	0.2	2.5	0.10
		420	654.978	0.4	180	14.0	0.35	20.0	0.15	655.319	0.2	180	0.2	2.0	0.06
		470	654.978	0.4	100	12.0	0.35	18.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		520	654.978	0.4	70	10.0	0.35	16.0	0.15	655.319	0.2	70	0.2	1.5	0.06
S	Titanium 3.7164	160	654.969	0.8	120	11.0	0.55	18.0	0.25	655.320	0.8	120	0.2	2.5	0.14
		260	654.968	0.4	120	10.0	0.35	17.0	0.15	655.320	0.8	120	0.2	2.5	0.14
		320	654.968	0.4	120	9.0	0.35	15.0	0.15	655.318	0.4	100	0.2	2.5	0.10
		370	654.968	0.4	100	9.0	0.35	15.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		420	654.968	0.4	80	8.0	0.35	14.0	0.15	655.319	0.2	70	0.2	1.5	0.06
		470	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	1.0	0.06
		520	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	160	654.969	0.8	50	9.0	0.40	14.0	0.2	655.326	0.4	50	0.2	1.5	0.10
		260	654.968	0.4	50	8.0	0.25	12.0	0.15	655.326	0.4	50	0.2	1.5	0.10
		320	654.968	0.4	40	8.0	0.25	12.0	0.15	655.326	0.4	40	0.2	1.5	0.10
		370	654.968	0.4	40	8.0	0.25	10.0	0.15	655.316	0.2	30	0.1	1.0	0.06
		420	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.8	0.06
		470	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.6	0.06

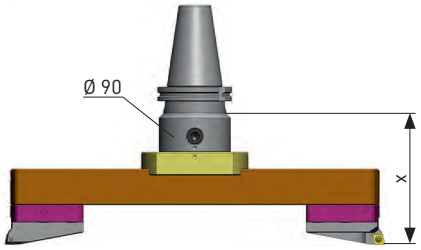
DVS rough boring

For double offset rough boring "DVS" a longer insert holder 637.951 / CC12 or 637.953 / CC16 has to be mounted on one side of the tool assembly. The longer insert holders are coloured black.

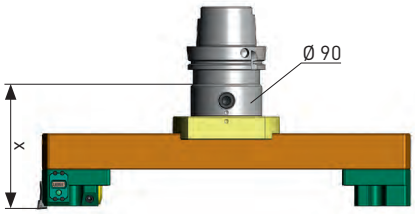
Extension slides: Ø 340 - 410 mm (picture 1+2), extension slides 318.224 / Ø 410 - 480 mm (picture 3+4), extension slide 318.225

Extension of the boring range for fine boring with additional insert holders: With insert holder size 2, 626.272 the boring range can be extended by 25 mm/Ø, and with insert holder size 3, 626.273 by 50 mm/Ø.

Picture 1



Picture 2



RSS

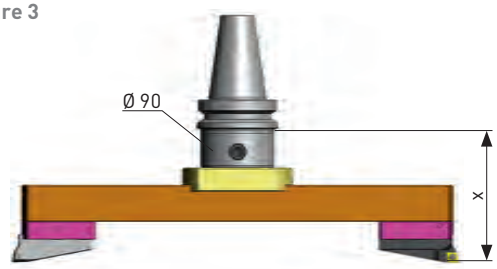
	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	160	654.993A	0.4	250	10.0	0.40	18.0	0.2	655.334	0.8	450	0.2	2.5	0.14
		260	654.993A	0.4	250	10.0	0.40	18.0	0.2	655.334	0.8	400	0.2	2.5	0.14
		320	654.993A	0.4	250	9.0	0.40	16.0	0.2	655.324	0.4	250	0.2	2.5	0.10
		370	654.993A	0.4	180	9.0	0.40	16.0	0.2	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	8.0	0.40	14.0	0.2	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.40	14.0	0.2	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.40	14.0	0.2	655.375	0.2	40	0.2	1.0	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	160	654.993A	0.4	230	10.0	0.35	18.0	0.15	655.334	0.8	450	0.2	2.5	0.14
		260	654.993A	0.4	230	10.0	0.35	18.0	0.15	655.334	0.8	400	0.2	2.5	0.14
		320	654.993A	0.4	230	9.0	0.35	16.0	0.15	655.324	0.4	250	0.2	2.5	0.10
		370	654.993A	0.4	180	9.0	0.35	16.0	0.15	655.324	0.4	180	0.2	2.0	0.10
		420	654.993A	0.4	120	8.0	0.35	14.0	0.15	655.375	0.2	120	0.2	1.5	0.06
		470	654.993A	0.4	60	8.0	0.35	14.0	0.15	655.375	0.2	60	0.2	1.0	0.06
		520	654.993A	0.4	40	8.0	0.35	14.0	0.15	655.375	0.2	40	0.2	1.0	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	160	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	350	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	300	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	160	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	350	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	300	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	160	654.964	0.4	180	10.0	0.35	17.0	0.15	655.320	0.8	300	0.2	2.0	0.14
		260	654.964	0.4	180	10.0	0.35	17.0	0.15	655.320	0.8	250	0.2	2.0	0.14
		320	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	220	0.2	2.0	0.10
		370	654.964	0.4	140	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	160	654.989	0.4	250	14.0	0.35	20.0	0.15	655.303A	0.8	350	0.2	2.5	0.14
		260	654.989	0.4	250	14.0	0.35	20.0	0.15	655.303A	0.8	350	0.2	2.5	0.14
		320	654.989	0.4	250	14.0	0.35	20.0	0.15	655.303A	0.8	250	0.2	2.5	0.14
		370	654.989	0.4	180	12.0	0.35	18.0	0.15	655.302A	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	12.0	0.35	18.0	0.15	655.301A	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.301A	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.301A	0.2	40	0.2	1.0	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

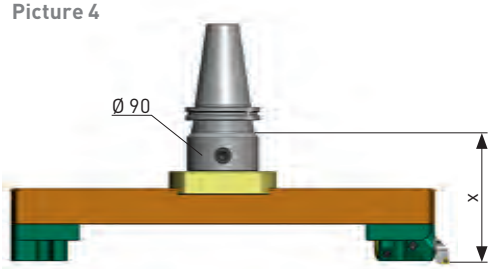
For cutting speeds above 400 m/min we recommend to use the counter weight 318.105 and to balance it according to the table (see operating instructions).

The weight of long tools can be substantially reduced by using CKN lightweight components with equal cutting performance.

Picture 3



Picture 4



DVS

	Workpiece material	Boring depth	Rough boring Serie 318							Fine boring EWN/EWE 200					
			Inserts		Vc	RSS		DVS		Inserts		Vc	Allow.		Feed
						Allow.	fn	Allow.	Feed				Std. val.	Max.	Ra 1.6 µm
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U	mm/Ø	mm/U	Order No.	R	m/min	mm/Ø	mm/Ø	mm/U
K	GGG < 500 N/mm2 GGG 40 GGG 50	160	654.989	0.4	230	14.0	0.35	20.0	0.15	655.390	0.8	350	0.2	2.5	0.14
		260	654.989	0.4	230	14.0	0.35	20.0	0.15	655.390	0.8	350	0.2	2.5	0.14
		320	654.989	0.4	230	14.0	0.35	20.0	0.15	655.380	0.4	250	0.2	2.5	0.10
		370	654.989	0.4	180	12.0	0.35	18.0	0.15	655.380	0.4	160	0.2	2.0	0.10
		420	654.989	0.4	120	12.0	0.35	18.0	0.15	655.370	0.2	120	0.2	1.5	0.06
		470	654.989	0.4	60	12.0	0.35	18.0	0.15	655.370	0.2	60	0.2	1.0	0.06
		520	654.989	0.4	40	12.0	0.35	18.0	0.15	655.370	0.2	40	0.2	1.0	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	160	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	320	0.2	2.0	0.14
		260	654.964	0.4	210	10.0	0.35	17.0	0.15	655.320	0.8	320	0.2	2.0	0.14
		320	654.964	0.4	210	9.0	0.35	15.0	0.15	655.318	0.4	240	0.2	2.0	0.10
		370	654.964	0.4	180	9.0	0.35	15.0	0.15	655.318	0.4	160	0.2	1.5	0.10
		420	654.964	0.4	120	8.0	0.35	14.0	0.15	655.319	0.2	120	0.2	1.0	0.06
		470	654.964	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	0.8	0.06
		520	654.964	0.4	40	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	0.8	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	160	654.995	0.4	900	14.0	0.35	20.0	0.15	655.398	0.8	1200	0.2	2.5	0.14
		260	654.995	0.4	750	14.0	0.35	20.0	0.15	655.398	0.8	750	0.2	2.5	0.14
		320	654.995	0.4	400	14.0	0.35	20.0	0.15	655.398	0.8	400	0.2	2.5	0.14
		370	654.995	0.4	300	12.0	0.35	18.0	0.15	655.388	0.4	300	0.2	2.5	0.10
		420	654.995	0.4	180	12.0	0.35	18.0	0.15	655.388	0.4	180	0.2	2.0	0.10
		470	654.995	0.4	100	12.0	0.35	18.0	0.15	655.378	0.2	100	0.2	1.5	0.06
		520	654.995	0.4	70	12.0	0.35	18.0	0.15	655.378	0.2	70	0.2	1.5	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	160	654.978	0.4	650	14.0	0.35	20.0	0.15	655.320	0.8	650	0.2	2.5	0.14
		260	654.978	0.4	650	14.0	0.35	20.0	0.15	655.320	0.8	650	0.2	2.5	0.14
		320	654.978	0.4	400	14.0	0.35	20.0	0.15	655.318	0.4	400	0.2	2.5	0.10
		370	654.978	0.4	300	12.0	0.35	18.0	0.15	655.318	0.4	300	0.2	2.5	0.10
		420	654.978	0.4	180	12.0	0.35	18.0	0.15	655.319	0.2	180	0.2	2.0	0.06
		470	654.978	0.4	100	12.0	0.35	18.0	0.15	655.319	0.2	100	0.2	1.5	0.06
		520	654.978	0.4	70	12.0	0.35	18.0	0.15	655.319	0.2	70	0.2	1.5	0.06
S	Titanium 3.7164	160	654.968	0.4	120	10.0	0.35	17.0	0.15	655.320	0.8	120	0.2	2.5	0.14
		260	654.968	0.4	120	10.0	0.35	17.0	0.15	655.320	0.8	120	0.2	2.5	0.14
		320	654.968	0.4	120	9.0	0.35	15.0	0.15	655.318	0.4	100	0.2	2.5	0.10
		370	654.968	0.4	100	9.0	0.35	15.0	0.15	655.318	0.4	80	0.2	2.0	0.10
		420	654.968	0.4	80	8.0	0.35	14.0	0.15	655.319	0.2	70	0.2	1.5	0.06
		470	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	60	0.2	1.0	0.06
		520	654.968	0.4	60	8.0	0.35	12.0	0.15	655.319	0.2	40	0.2	1.0	0.06
	Ni-basic-, Co-basic-, Alloys	160	654.968	0.4	50	8.0	0.25	12.0	0.15	655.326	0.4	50	0.2	1.5	0.10
		260	654.968	0.4	50	8.0	0.25	12.0	0.15	655.326	0.4	50	0.2	1.5	0.10
		320	654.968	0.4	40	8.0	0.25	12.0	0.15	655.326	0.4	40	0.2	1.5	0.10
		370	654.968	0.4	40	8.0	0.25	10.0	0.15	655.316	0.2	30	0.1	1.0	0.06
		420	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.8	0.06
		470	654.968	0.4	30	6.0	0.25	8.0	0.15	655.316	0.2	30	0.1	0.6	0.06

DVS rough boring

For double offset rough boring "DVS" a longer insert holder 637.951 / CC12 or 637.953 / CC16 has to be mounted on one side of the tool assembly. The longer insert holders are coloured black.

Extension slides: Ø 480 - 550 mm (picture 1+2), extension slides 318.226 / Ø 550 - 620 mm (picture 3+4), extension slides 318.227

Extension of the boring range for fine boring with additional insert holders: With insert holder size 2, 626.272 the boring range can be extended by 25 mm/Ø, and with insert holder size 3, 626.273 by 50 mm/Ø.

The fine boring heads EWN 04-7 and EWN 04-15 are mainly used in the watch and micro industry. Therefore these heads are available with the BIG KAISER-CK connection and with cylindrical shank. For chucking the boring heads with cylindrical shank we recommend BIG MEGA CHUCK collet holders or hydraulic chucks.

Fine boring heads EWN 04-7 (headline bright purple)
The highest permissible spindle speed for these boring heads is 30 000 rpm. When working with high spindle speeds (n > 15 000 rpm), the whole and pre-set tool assembly has to be balanced. We recommend the use of a fine balanced tool shank for all operations.

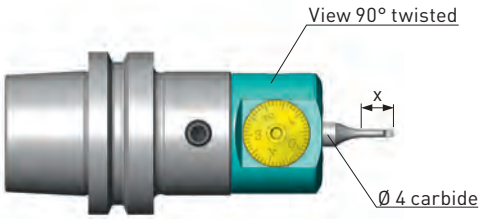
Boring cutters with uncoated or coated cutting edges are available. They have a 4 mm shank and are made with flats for the cutting edge orientation. For OD turning in the range of Ø 0.2 - 2.3 mm there are pin turning cutters on offer. The boring depth and the pin length "X" are limited by the boring- and pin turning cutters.

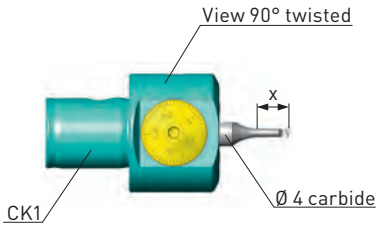
Fine boring heads EWN 04-15 (headline dark purple)
These boring heads are certified for a max. spindle speed of 20 000 rpm. When working with high spindle speeds (n > 10 000 rpm) the whole and pre-set tool assembly has to be balanced. We recommend the use of a fine balanced tool shank for all operations.

For boring in the range between Ø 0.4 - 6.0 mm there are carbide boring cutters with coated cutting edge available. The range from Ø 5.8 - 15.5 mm is covered with carbide tool holders for inserts. The shank diameter for the boring cutters and the tool holders is 7 mm.
For OD turning from Ø 0.2 - 6.0, there are two different carbide pin turning cutters on offer. The boring depth and the pin length "X" are limited by the boring- and pin turning cutters and the tool holders.

In the table the following terms and dimensions are used:

Workpiece material:	Only rough classification of metallic materials	
Boring depth X:	Given by the boring cutter or tool holder	(mm)
Carbide boring cutter/Insert:	For information about carbide boring cutters and inserts consult BIG KAISER main catalogue.	
R:	Nose radius of boring cutter/insert	(mm)
Vc:	Cutting speed	(m/min)
Stock allow.:	Sock allowance per cut in Ø	(mm)
fn:	Feed per revolution	(mm/U)





Workpiece material		Ø 0.4-0.6 / 0.9 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	1.1 1.5	615.561 615.541	0.10 0.05	35	0.1	0.04 0.02
M	Stainless steels	1.1 1.5	615.561 615.541	0.10 0.05	35	0.1	0.04 0.02
K	Cast iron	1.1 1.5	615.561 615.541	0.10 0.05	35	0.1	0.04 0.02
N	Aluminium	1.1 1.5	615.551 615.541	0.10 0.05	35	0.1	0.04 0.02
N	Non-ferrous metals	1.1 1.5	615.561 615.541	0.10 0.05	35	0.1	0.04 0.02
S	Titaniumium	1.1 1.5	615.561 615.541	0.10 0.05	30	0.1	0.04 0.02

Ø 0.6-0.8 / 0.9 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
1.5	615.562 615.541	0.10 0.05	55	0.1	0.04 0.02
1.5	615.562 615.541	0.10 0.05	55	0.1	0.04 0.02
1.5	615.562 615.541	0.10 0.05	55	0.1	0.04 0.02
1.5	615.552 615.541	0.10 0.05	55	0.1	0.04 0.02
1.5	615.562 615.541	0.10 0.05	55	0.1	0.04 0.02
1.5	615.562 615.541	0.10 0.05	50	0.1	0.04 0.02

Workpiece material		Ø 0.8-1.2 / 0.9-1.4 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	2.0 3.0	615.563 615.542	0.10 0.05	75	0.1	0.04 0.02
M	Stainless steels	2.0 3.0	615.563 615.542	0.10 0.05	75	0.1	0.04 0.02
K	Cast iron	2.0 3.0	615.563 615.542	0.10 0.05	75	0.1	0.04 0.02
N	Aluminium	2.0 3.0	615.553 615.542	0.10 0.05	75	0.1	0.04 0.02
N	Non-ferrous metals	2.0 3.0	615.563 615.542	0.10 0.05	75	0.1	0.04 0.02
S	Titaniumium	2.0 3.0	615.563 615.542	0.10 0.05	50	0.1	0.04 0.02

Ø 1.2-1.5 / 0.9-1.4 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
2.5 3.0	615.564 615.542	0.10 0.05	85	0.1	0.04 0.02
2.5 3.0	615.564 615.542	0.10 0.05	85	0.1	0.04 0.02
2.5 3.0	615.564 615.542	0.10 0.05	85	0.1	0.04 0.02
2.5 3.0	615.554 615.542	0.10 0.05	85	0.1	0.04 0.02
2.5 3.0	615.564 615.542	0.10 0.05	85	0.1	0.04 0.02
2.5 3.0	615.564 615.542	0.10 0.05	50	0.1	0.04 0.02

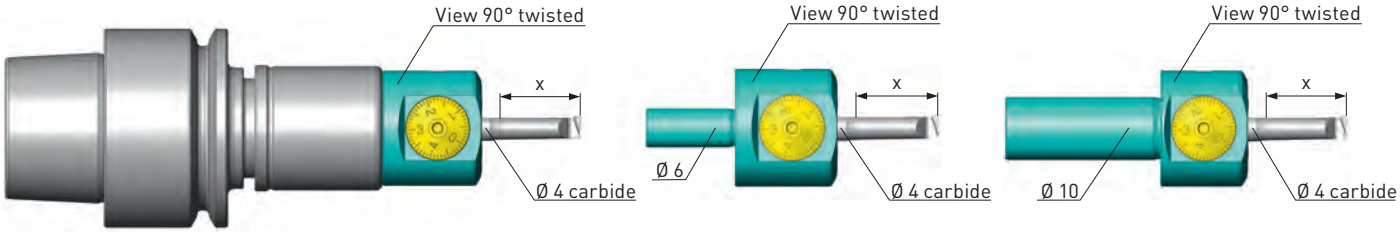
Workpiece material		Ø 1.5-1.9 /1.4-2.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	3.5 5.0	615.565 615.543	0.20 0.05	140	0.1	0.06 0.02
M	Stainless steels	3.5 5.0	615.565 615.543	0.20 0.05	125	0.1	0.06 0.02
K	Cast iron	3.5 5.0	615.565 615.543	0.20 0.05	140	0.1	0.06 0.02
N	Aluminium	3.5 5.0	615.555 615.543	0.20 0.05	140	0.1	0.06 0.02
N	Non-ferrous metals	3.5 5.0	615.565 615.543	0.20 0.05	140	0.1	0.06 0.02
S	Titaniumium	3.5 5.0	615.565 615.543	0.20 0.05	50	0.1	0.06 0.02

Ø 1.9-3.0 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
4.5 6.0	615.566 615.544	0.20 0.05	175	0.1	0.06 0.02
4.5 6.0	615.566 615.544	0.20 0.05	125	0.1	0.06 0.02
4.5 6.0	615.566 615.544	0.20 0.05	175	0.1	0.06 0.02
4.5 6.0	615.566 615.544	0.20 0.05	175	0.1	0.06 0.02
4.5 6.0	615.566 615.544	0.20 0.05	175	0.1	0.06 0.02
4.5 6.0	615.566 615.544	0.20 0.05	50	0.1	0.06 0.02

Remark:

* Vc max. corresponds either to the max. permissible spindle speed for this fine boring head (30 000 rpm), or to the max. cutting speed for the machining of the corresponding workpiece material.

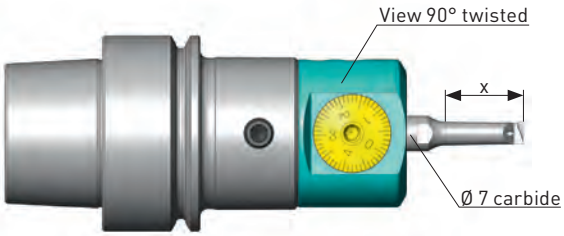
For cutting with high spindle speeds (> 15 000 rpm), the complete and pre-set tool assembly has to be fine balanced. For all operations we recommend to use a fine balanced tool shank.

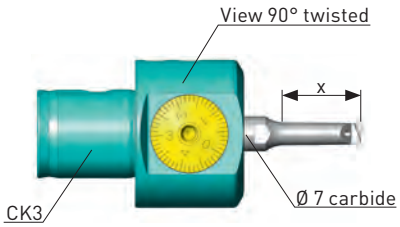


Workpiece material		Ø 2.9-4.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	10	615.545	0.05	250	0.1	0.02
M	Stainless steels	10	615.545	0.05	150	0.1	0.02
K	Cast iron	10	615.545	0.05	250	0.1	0.02
N	Aluminium	10	615.545	0.05	270	0.1	0.02
N	Non-ferrous metals	10	615.545	0.05	250	0.1	0.02
S	Titaniumium	10	615.545	0.05	50	0.1	0.02

Ø 3.9-5.0 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
13	615.546	0.05	250	0.1	0.02
13	615.546	0.05	150	0.1	0.02
13	615.546	0.05	250	0.1	0.02
13	615.546	0.05	350	0.1	0.02
13	615.546	0.05	250	0.1	0.02
13	615.546	0.05	50	0.1	0.02

Workpiece material		Ø 4.9-7.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	16	615.547	0.05	250	0.1	0.02
M	Stainless steels	16	615.547	0.05	150	0.1	0.02
K	Cast iron	16	615.547	0.05	250	0.1	0.02
N	Aluminium	16	615.547	0.05	350	0.1	0.02
N	Non-ferrous metals	16	615.547	0.05	250	0.1	0.02
S	Titaniumium	16	615.547	0.05	50	0.1	0.02





Workpiece material		Ø 0.4-1.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	1.5	615.522	0.05	25	0.1	0.02
M	Stainless steels	1.5	615.522	0.05	25	0.1	0.02
K	Cast iron	1.5	615.522	0.05	25	0.1	0.02
N	Aluminium	1.5	615.522	0.05	25	0.1	0.02
	Non-ferrous metals	1.5	615.522	0.05	25	0.1	0.02
S	Titaniumium	1.5	615.522	0.05	25	0.1	0.02

Ø 0.9-1.5 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
3	615.524	0.05	55	0.1	0.02
3	615.524	0.05	55	0.1	0.02
3	615.524	0.05	55	0.1	0.02
3	615.524	0.05	55	0.1	0.02
3	615.524	0.05	55	0.1	0.02
3	615.524	0.05	50	0.1	0.02

Workpiece material		Ø 1.4-2.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	5	615.525	0.05	85	0.1	0.02
M	Stainless steels	5	615.525	0.05	85	0.1	0.02
K	Cast iron	5	615.525	0.05	85	0.1	0.02
N	Aluminium	5	615.525	0.05	85	0.1	0.02
	Non-ferrous metals	5	615.525	0.05	85	0.1	0.02
S	Titaniumium	5	615.525	0.05	50	0.1	0.02

Ø 1.9-3.0 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
6	615.501	0.05	110	0.1	0.02
6	615.501	0.05	110	0.1	0.02
6	615.501	0.05	110	0.1	0.02
6	615.501	0.05	110	0.1	0.02
6	615.501	0.05	110	0.1	0.02
6	615.501	0.05	50	0.1	0.02

Workpiece material		Ø 2.9-4.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	10	615.502	0.05	180	0.1	0.02
M	Stainless steels	10	615.502	0.05	150	0.1	0.02
K	Cast iron	10	615.502	0.05	180	0.1	0.02
N	Aluminium	10	615.502	0.05	180	0.1	0.02
	Non-ferrous metals	10	615.502	0.05	180	0.1	0.02
S	Titaniumium	10	615.502	0.05	50	0.1	0.02

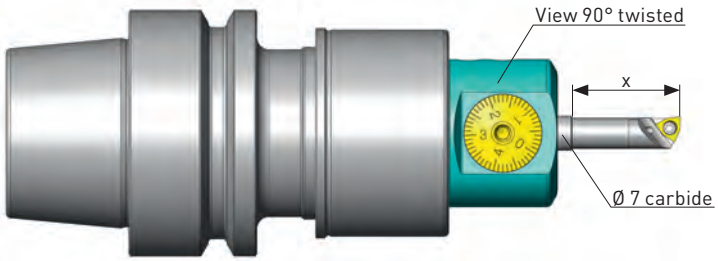
Ø 3.9-5.0 mm					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
13	615.503	0.05	240	0.1	0.02
13	615.503	0.05	150	0.1	0.02
13	615.503	0.05	240	0.1	0.02
13	615.503	0.05	240	0.1	0.02
13	615.503	0.05	240	0.1	0.02
13	615.503	0.05	50	0.1	0.02

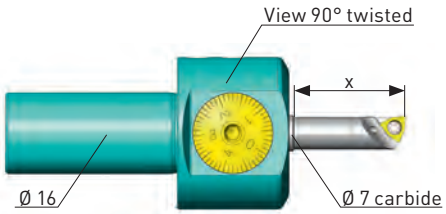
Workpiece material		Ø 4.9-6.0mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	16	615.504	0.05	250	0.1	0.02
M	Stainless steels	16	615.504	0.05	150	0.1	0.02
K	Cast iron	16	615.504	0.05	250	0.1	0.02
N	Aluminium	16	615.504	0.05	300	0.1	0.02
	Non-ferrous metals	16	615.504	0.05	300	0.1	0.02
S	Titaniumium	16	615.504	0.05	50	0.1	0.02

Remark:

* Vc max. corresponds either to the max. permissible spindle speed for this fine boring head (20 000 rpm), or to the max. cutting speed for the machining of the corresponding workpiece material.

For cutting with high spindle speeds (> 10 000 rpm), the complete and pre-set tool assembly has to be fine balanced. For all operations we recommend to use a fine balanced tool shank.





Workpiece material		Ø 5.8-7.0 mm Tool holder 615.505					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	20	655.606	0.1	250	0.1	0.04
M	Stainless steels	20	655.606	0.1	150	0.1	0.04
K	Cast iron	20	655.605	0.1	250	0.1	0.04
N	Aluminium	20	655.604	0.1	360	0.1	0.04
	Non-ferrous metals	20	655.604	0.1	300	0.1	0.04
S	Titaniumium	20	655.606	0.1	60	0.1	0.04

Ø 6.8-8.0 mm Tool holder 615.506					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
20	655.606	0.1	250	0.1	0.04
20	655.606	0.1	150	0.1	0.04
20	655.605	0.1	250	0.1	0.04
20	655.604	0.1	360	0.1	0.04
20	655.604	0.1	300	0.1	0.04
20	655.606	0.1	60	0.1	0.04

Workpiece material		Ø 7.8-9.0 mm Tool holder 615.507					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	30	651.837	0.2	250	0.1	0.06
M	Stainless steels	30	651.837	0.2	150	0.1	0.06
K	Cast iron	30	651.837	0.2	250	0.1	0.06
N	Aluminium	30	651.825	0.2	360	0.1	0.06
	Non-ferrous metals	30	651.825	0.2	300	0.1	0.06
S	Titaniumium	30	651.837	0.2	70	0.1	0.06

Ø 8.8-10.0 mm Tool holder 615.508					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
30	651.837	0.2	250	0.1	0.06
30	651.837	0.2	150	0.1	0.06
30	651.837	0.2	250	0.1	0.06
30	651.825	0.2	360	0.1	0.06
30	651.825	0.2	300	0.1	0.06
30	651.837	0.2	70	0.1	0.06

Workpiece material		Ø 9.8-12.0 mm Tool holder 615.509					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	30	651.837	0.2	250	0.1	0.06
M	Stainless steels	30	651.837	0.2	150	0.1	0.06
K	Cast iron	30	651.837	0.2	250	0.1	0.06
N	Aluminium	30	651.825	0.2	360	0.1	0.06
	Non-ferrous metals	30	651.825	0.2	300	0.1	0.06
S	Titaniumium	30	651.837	0.2	70	0.1	0.06

Ø 11.8-15.5 mm Tool holder 615.511					
Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
X [mm]	Order No.	R	m/min	mm/Ø	mm/U
30	651.837	0.2	250	0.1	0.06
30	651.837	0.2	150	0.1	0.06
30	651.837	0.2	250	0.1	0.06
30	651.825	0.2	360	0.1	0.06
30	651.825	0.2	300	0.1	0.06
30	651.837	0.2	70	0.1	0.06


BATTERY
CR 1025

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 start from Ø 2.0 mm and are the same for all the heads up to the diameter range Ø 8.8 - 10.0 (12.8) mm. On these pages, there is a two colour headline bright and dark yellow. As from diameter 9.8 mm, there are different cutting data for the heads EWN 04-22 and EWN/EWE 2-32. The headlines for EWN 04-22 are coloured bright yellow, the ones for EWN/EWE 2-32 dark yellow.

The cutting data are applicable when tool holders and boring cutters made of carbide are used (exception EWN 04-22, diameter range 13.8 - 21.8 mm). The different diameter ranges are in line with the existing accessories. On a double page, there is the cutting data for one specific diameter range. The columns "universal" and "optimized" differ in terms of cutting data and inserts.

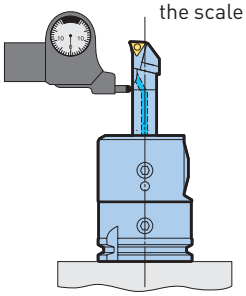
The cutting data in **the column „optimized"** are applicable when the best possible accessories for each diameter range are used. This includes the use of adjustable tool holders for the EWN/EWE 2-32 for diameter 9.8 mm and bigger. The optimized accessories are clamped in the center, or close to the central position. Therefore, the imbalance is minimized, which permits higher cutting speeds. The listed inserts reflect the best possible choices under consideration of workpiece material and boring depth.

In **the column „universal"**, the cutting data are lower and the choice of inserts is reduced. The lower data permits a bigger applicable boring range (starting diameter + 4 mm). The use of this data is recommended for single piece production.

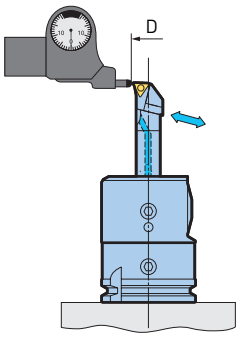
Important: The cutting data must in any case be adapted to the working conditions

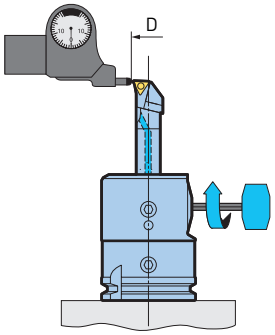
Application advices for adjustable tool holders

Set adjustable tool holder to the centre position by means of the scale screw



Set the insert holder to the desired diameter





Measuring cut: Reduce diameter setting by 0.1 mm by means of the scale screw

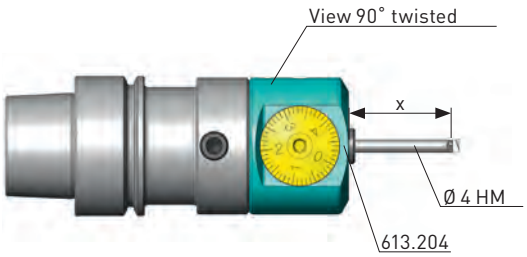
- Adjust insert holder to the measuring cut diameter
- Perform measuring cut, measure bore diameter
- Adjust difference by means of scale screw

In the table the following terms and dimensions are used:

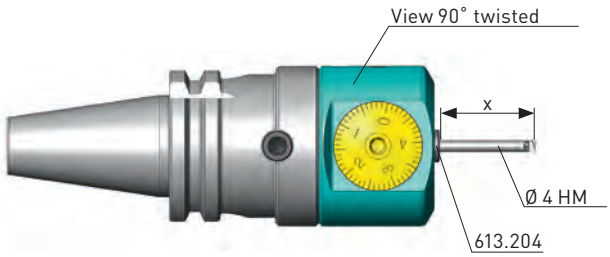
Workpiece material:	Material no. according to DIN or generally used designation	
Boring depth X:	Projection of the tool holder	(mm)
Insert:	Detailed information about the inserts is shown in the BIG KAISER main catalogue.	
R:	Nose radius of boring cutter/insert	(mm)
Vc:	Cutting speed	(m/min)
Stock allow.:	Sock allowance per cut in Ø	(mm)
fn:	Feed per revolution	(mm/U)
Ra:	Surface quality (Ra 1.6 µm for N7)	

Balanceable fine boring head EWB 2-32

There are special cutting data and adjustment tables for the balanceable fine boring head EWB 2-32. They are delivered with the tool.



EWN 04-22



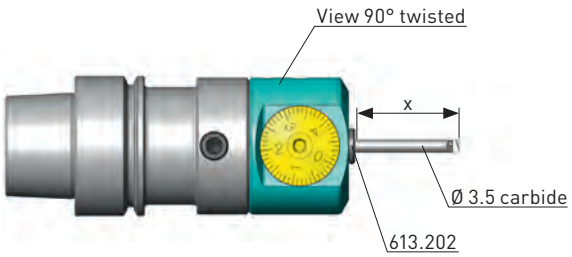
EWN 2-32

Workpiece material		Ø 2.0-3.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	9	611.155	0.2	60	0.1	0.008
M	Stainless steels	9	611.155	0.2	60	0.1	0.008
K	Cast iron	9	611.155	0.2	60	0.1	0.008
N	Aluminium	9	611.155	0.2	60	0.1	0.008
	Non-ferrous metals	9	611.155	0.2	60	0.1	0.008
S	Titaniumium	9	611.155	0.2	40	0.1	0.008

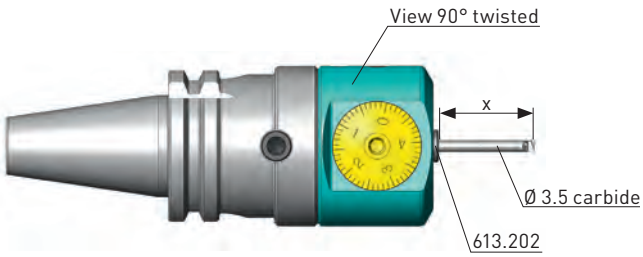
Workpiece material		Ø 3.0-3.9 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	14	611.156	0.2	90	0.1	0.008
M	Stainless steels	14	611.156	0.2	90	0.1	0.008
K	Cast iron	14	611.156	0.2	90	0.1	0.008
N	Aluminium	14	611.156	0.2	90	0.1	0.008
	Non-ferrous metals	14	611.156	0.2	90	0.1	0.008
S	Titaniumium	14	611.156	0.2	50	0.1	0.008

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used. For the EWN 04-22 only short reducers are available.



EWN 04-22

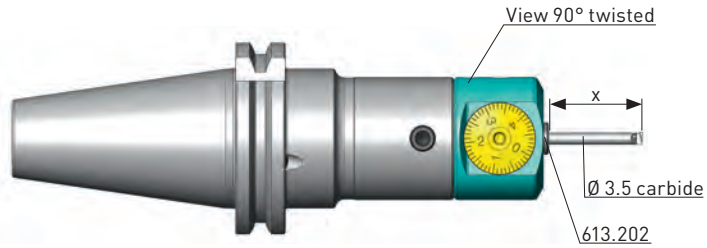


EWN 2-32

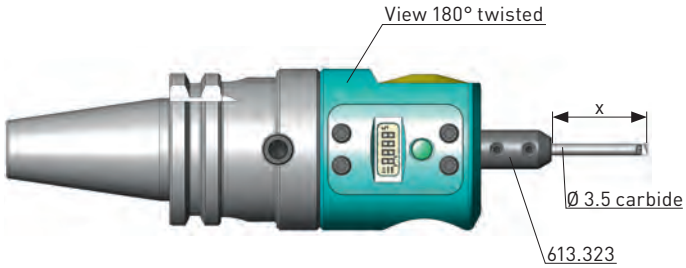
	Workpiece material	Boring depth	universal Ø 3.9 - 7.9 mm							optimized Ø 3.9 - 4.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	615.203A	0.1	80	0.1	0.3	0.04	0.08	615.203A	0.1	90	0.1	0.3	0.04	0.08
		15	615.203A	0.1	65	0.1	0.3	0.04	0.08	615.203A	0.1	70	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	615.203A	0.1	80	0.1	0.3	0.04	0.08	615.203A	0.1	90	0.1	0.3	0.04	0.08
		15	615.203A	0.1	65	0.1	0.3	0.04	0.08	615.203A	0.1	70	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		15	615.203A	0.1	60	0.1	0.3	0.04	0.08	615.203A	0.1	65	0.1	0.3	0.04	0.08
		20	615.203A	0.1	45	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	30	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used. For the EWN 04-22 only short reducers are available.



EWN 04-22

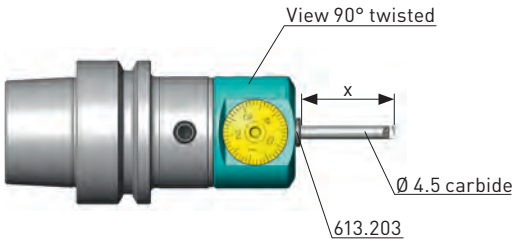


EWE 2-32

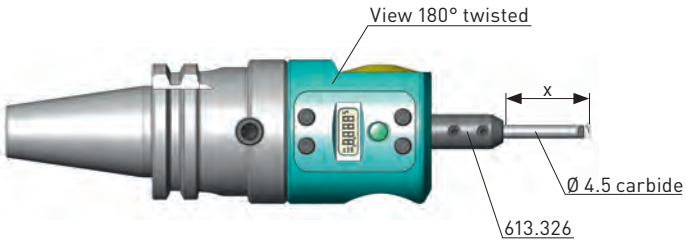
	Workpiece material	Boring depth	universal Ø 3.9 - 7.9 mm							optimized Ø 3.9 - 4.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	10	615.203A	0.1	90	0.10	0.3	0.04	0.08	615.203A	0.1	100	0.10	0.3	0.04	0.08
	< 500 N/mm2	15	615.203A	0.1	70	0.10	0.3	0.04	0.08	615.203A	0.1	80	0.10	0.3	0.04	0.08
	GGG 40	20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	55	0.10	0.2	0.04	0.06
	GGG 50	25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	40	0.10	0.2	0.04	0.06
		30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	30	0.10	0.2	0.04	0.06
	GGG	10	615.203A	0.1	80	0.10	0.3	0.04	0.08	615.203A	0.1	90	0.10	0.3	0.04	0.08
	< 800 N/mm2	15	615.203A	0.1	65	0.10	0.3	0.04	0.08	615.203A	0.1	70	0.10	0.3	0.04	0.08
	GGG 60	20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	50	0.10	0.2	0.04	0.06
	GGG 70	25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
	GGG 80	30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
N	Aluminium	10	615.203	0.1	100	0.10	0.3	0.04	0.08	615.203	0.1	120	0.10	0.3	0.04	0.08
	Wrought alloys	15	615.203	0.1	85	0.10	0.3	0.04	0.08	615.203	0.1	100	0.10	0.3	0.04	0.08
	Si < 10%	20	615.203	0.1	60	0.10	0.2	0.04	0.06	615.203	0.1	75	0.10	0.2	0.04	0.06
	3.1354	25	615.203	0.1	40	0.10	0.2	0.04	0.06	615.203	0.1	55	0.10	0.2	0.04	0.06
	3.2315	30	615.203	0.1	30	0.10	0.2	0.04	0.06	615.203	0.1	35	0.10	0.2	0.04	0.06
	3.3545	35	615.203	0.1	20	0.10	0.2	0.04	0.06	615.203	0.1	25	0.10	0.2	0.04	0.06
	3.4365															
	Aluminium	10	615.203A	0.1	100	0.10	0.3	0.04	0.08	615.203A	0.1	120	0.10	0.3	0.04	0.08
	Cast alloys	15	615.203A	0.1	85	0.10	0.3	0.04	0.08	615.203A	0.1	100	0.10	0.3	0.04	0.08
	Si > 10%	20	615.203A	0.1	60	0.10	0.2	0.04	0.06	615.203A	0.1	75	0.10	0.2	0.04	0.06
	G-AlSi 12	25	615.203A	0.1	40	0.10	0.2	0.04	0.06	615.203A	0.1	55	0.10	0.2	0.04	0.06
	G-AlSi17Cu4Mg	30	615.203A	0.1	30	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
		35	615.203A	0.1	20	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
S	Titanium	10	615.203A	0.1	90	0.10	0.3	0.04	0.08	615.203A	0.1	90	0.10	0.3	0.04	0.08
	3.7164	15	615.203A	0.1	70	0.10	0.3	0.04	0.08	615.203A	0.1	70	0.10	0.3	0.04	0.08
		20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	50	0.10	0.2	0.04	0.06
		25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
		30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
	Ni-basic-,	10	615.203A	0.1	40	0.05	0.1	0.04	0.06	615.203A	0.1	40	0.05	0.1	0.04	0.06
	Co-basic-,	15	615.203A	0.1	30	0.05	0.1	0.04	0.06	615.203A	0.1	30	0.05	0.1	0.04	0.06
	Alloys	20	615.203A	0.1	30	0.05	0.1	0.04	0.06	615.203A	0.1	30	0.05	0.1	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 4.9 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended



EWN 04-22

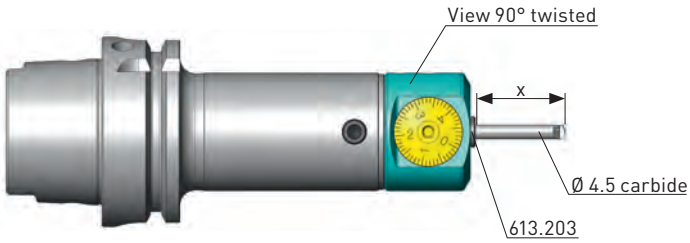


EWE 2-32

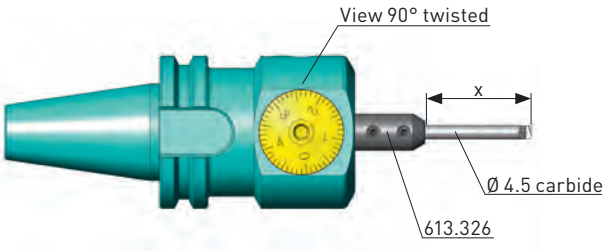
	Workpiece material	Boring depth	universal Ø 4.9 - 8.9 mm							optimized Ø 4.9 - 5.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	615.204A	0.1	100	0.1	0.3	0.04	0.08	615.204A	0.1	120	0.1	0.3	0.04	0.08
		15	615.204A	0.1	80	0.1	0.3	0.04	0.08	615.204A	0.1	100	0.1	0.3	0.04	0.08
		20	615.204A	0.1	60	0.1	0.3	0.04	0.08	615.204A	0.1	80	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	615.204A	0.1	100	0.1	0.3	0.04	0.08	615.204A	0.1	120	0.1	0.3	0.04	0.08
		15	615.204A	0.1	80	0.1	0.3	0.04	0.08	615.204A	0.1	100	0.1	0.3	0.04	0.08
		20	615.204A	0.1	60	0.1	0.3	0.04	0.08	615.204A	0.1	80	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	615.204A	0.1	90	0.1	0.3	0.04	0.08	615.204A	0.1	110	0.1	0.3	0.04	0.08
		15	615.204A	0.1	75	0.1	0.3	0.04	0.08	615.204A	0.1	90	0.1	0.3	0.04	0.08
		20	615.204A	0.1	55	0.1	0.3	0.04	0.08	615.204A	0.1	75	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	615.204A	0.1	90	0.1	0.3	0.04	0.08	615.204A	0.1	110	0.1	0.3	0.04	0.08
		15	615.204A	0.1	75	0.1	0.3	0.04	0.08	615.204A	0.1	90	0.1	0.3	0.04	0.08
		20	615.204A	0.1	55	0.1	0.3	0.04	0.08	615.204A	0.1	75	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	615.204A	0.1	80	0.1	0.3	0.04	0.08	615.204A	0.1	100	0.1	0.3	0.04	0.08
		15	615.204A	0.1	70	0.1	0.3	0.04	0.08	615.204A	0.1	80	0.1	0.3	0.04	0.08
		20	615.204A	0.1	55	0.1	0.3	0.04	0.08	615.204A	0.1	65	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	10	615.204A	0.1	100	0.1	0.3	0.04	0.08	615.204A	0.1	120	0.1	0.3	0.04	0.08
		15	615.204A	0.1	80	0.1	0.3	0.04	0.08	615.204A	0.1	100	0.1	0.3	0.04	0.08
		20	615.204A	0.1	60	0.1	0.3	0.04	0.08	615.204A	0.1	80	0.1	0.3	0.04	0.08
		25	615.204A	0.1	45	0.1	0.2	0.04	0.06	615.204A	0.1	55	0.1	0.2	0.04	0.06
		30	615.204A	0.1	35	0.1	0.2	0.04	0.06	615.204A	0.1	40	0.1	0.2	0.04	0.06
		35	615.204A	0.1	25	0.1	0.2	0.04	0.06	615.204A	0.1	30	0.1	0.2	0.04	0.06

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used. For the EWN 04-22 only short reducers are available.



EWN 04-22

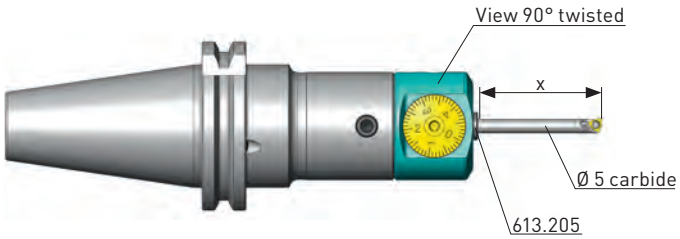


EWN 2-32

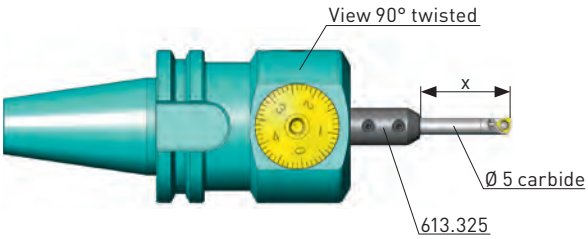
	Workpiece material	Boring depth	universal Ø 4.9 - 8.9 mm							optimized Ø 4.9 - 5.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	10	615.204A	0.1	100	0.10	0.3	0.04	0.08	615.204A	0.1	120	0.10	0.3	0.04	0.08
		15	615.204A	0.1	80	0.10	0.3	0.04	0.08	615.204A	0.1	100	0.10	0.3	0.04	0.08
		20	615.204A	0.1	60	0.10	0.3	0.04	0.08	615.204A	0.1	80	0.10	0.3	0.04	0.08
		25	615.204A	0.1	45	0.10	0.2	0.04	0.06	615.204A	0.1	55	0.10	0.2	0.04	0.06
		30	615.204A	0.1	35	0.10	0.2	0.04	0.06	615.204A	0.1	40	0.10	0.2	0.04	0.06
		35	615.204A	0.1	25	0.10	0.2	0.04	0.06	615.204A	0.1	30	0.10	0.2	0.04	0.06
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	10	615.204A	0.1	90	0.10	0.3	0.04	0.08	615.204A	0.1	110	0.10	0.3	0.04	0.08
		15	615.204A	0.1	75	0.10	0.3	0.04	0.08	615.204A	0.1	90	0.10	0.3	0.04	0.08
		20	615.204A	0.1	55	0.10	0.3	0.04	0.08	615.204A	0.1	75	0.10	0.3	0.04	0.08
		25	615.204A	0.1	45	0.10	0.2	0.04	0.06	615.204A	0.1	55	0.10	0.2	0.04	0.06
		30	615.204A	0.1	35	0.10	0.2	0.04	0.06	615.204A	0.1	40	0.10	0.2	0.04	0.06
		35	615.204A	0.1	25	0.10	0.2	0.04	0.06	615.204A	0.1	30	0.10	0.2	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	10	615.204	0.1	100	0.10	0.3	0.04	0.08	615.204	0.1	150	0.10	0.3	0.04	0.08
		15	615.204	0.1	100	0.10	0.3	0.04	0.08	615.204	0.1	140	0.10	0.3	0.04	0.08
		20	615.204	0.1	80	0.10	0.3	0.04	0.08	615.204	0.1	120	0.10	0.3	0.04	0.08
		25	615.204	0.1	65	0.10	0.2	0.04	0.06	615.204	0.1	90	0.10	0.2	0.04	0.06
		30	615.204	0.1	50	0.10	0.2	0.04	0.06	615.204	0.1	60	0.10	0.2	0.04	0.06
		35	615.204	0.1	30	0.10	0.2	0.04	0.06	615.204	0.1	40	0.10	0.2	0.04	0.06
		40	615.204	0.1	20	0.10	0.2	0.04	0.06	615.204	0.1	25	0.10	0.2	0.04	0.06
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	10	615.204A	0.1	100	0.10	0.3	0.04	0.08	615.204A	0.1	150	0.10	0.3	0.04	0.08
		15	615.204A	0.1	100	0.10	0.3	0.04	0.08	615.204A	0.1	140	0.10	0.3	0.04	0.08
		20	615.204A	0.1	80	0.10	0.2	0.04	0.06	615.204A	0.1	120	0.10	0.3	0.04	0.08
		25	615.204A	0.1	65	0.10	0.2	0.04	0.06	615.204A	0.1	90	0.10	0.2	0.04	0.06
		30	615.204A	0.1	50	0.10	0.2	0.04	0.06	615.204A	0.1	60	0.10	0.2	0.04	0.06
		35	615.204A	0.1	30	0.10	0.2	0.04	0.06	615.204A	0.1	40	0.10	0.2	0.04	0.06
		40	615.204A	0.1	20	0.10	0.2	0.04	0.06	615.204A	0.1	25	0.10	0.2	0.04	0.06
S	Titanium 3.7164	10	615.204A	0.1	90	0.10	0.3	0.04	0.08	615.204A	0.1	100	0.10	0.3	0.04	0.08
		15	615.204A	0.1	80	0.10	0.3	0.04	0.08	615.204A	0.1	90	0.10	0.3	0.04	0.08
		20	615.204A	0.1	60	0.10	0.2	0.04	0.06	615.204A	0.1	60	0.10	0.2	0.04	0.06
		25	615.204A	0.1	45	0.10	0.2	0.04	0.06	615.204A	0.1	45	0.10	0.2	0.04	0.06
		30	615.204A	0.1	35	0.10	0.2	0.04	0.06	615.204A	0.1	35	0.10	0.2	0.04	0.06
		35	615.204A	0.1	25	0.10	0.2	0.04	0.06	615.204A	0.1	25	0.10	0.2	0.04	0.06
	Ni-basic-, Co-basic-, Alloys	10	615.204A	0.1	40	0.05	0.1	0.04	0.06	615.204A	0.1	40	0.05	0.1	0.04	0.06
		15	615.204A	0.1	30	0.05	0.1	0.04	0.06	615.204A	0.1	30	0.05	0.1	0.04	0.06
		20	615.204A	0.1	30	0.05	0.1	0.04	0.06	615.204A	0.1	30	0.05	0.1	0.04	0.06
		25	615.204A	0.1	30	0.05	0.1	0.04	0.06	615.204A	0.1	30	0.05	0.1	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 5.9 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended



EWN 04-22

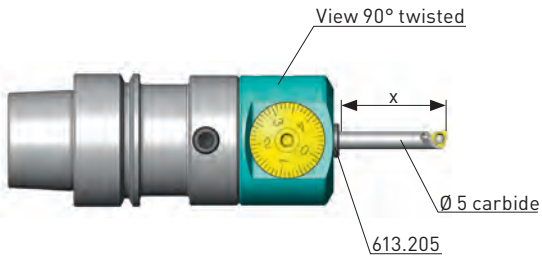


EWN 2-32

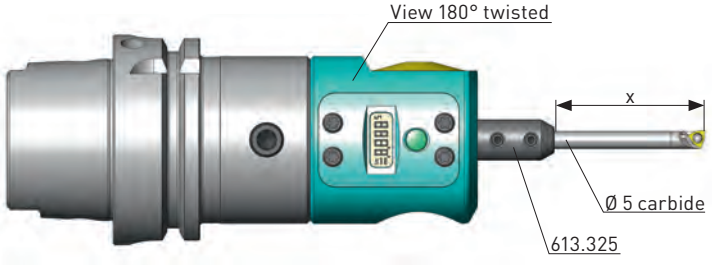
	Workpiece material	Boring depth	universal Ø 5.8 - 9.8 mm							optimized Ø 5.8 - 7.3 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
		20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		30	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	90	0.1	0.3	0.06	0.07
		40	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
		20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		30	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	90	0.1	0.3	0.06	0.07
		40	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
		50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
		50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	110	0.1	0.3	0.06	0.08
		20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	90	0.1	0.3	0.06	0.08
		30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	70	0.1	0.3	0.06	0.06
		40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
		50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	10	655.603	0.2	100	0.1	0.4	0.06	0.10	655.603	0.2	150	0.1	0.4	0.06	0.10
		20	655.603	0.2	80	0.1	0.4	0.06	0.10	655.603	0.2	120	0.1	0.4	0.06	0.10
		30	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	90	0.1	0.4	0.06	0.07
		40	655.605	0.1	60	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		50	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		60	655.605	0.1	25	0.1	0.2	0.04	0.07	655.605	0.1	30	0.1	0.2	0.04	0.07

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used. For the EWN 04-22 only short reducers are available.



EWN 04-22

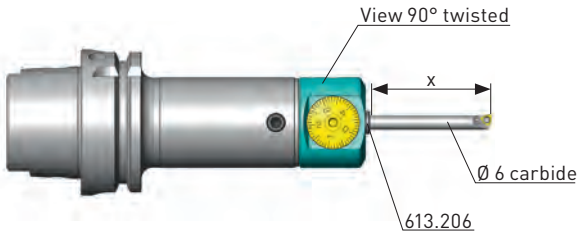


EWE 2-32

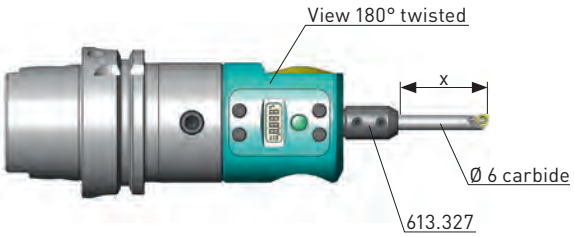
	Workpiece material	Boring depth	universal Ø 5.8 - 9.8 mm							optimized Ø 5.8 - 7.3 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	10	655.603	0.2	100	0.1	0.3	0.06	0.10	655.603	0.2	150	0.1	0.3	0.06	0.10
	< 500 N/mm2	20	655.603	0.2	80	0.1	0.3	0.06	0.10	655.603	0.2	120	0.1	0.3	0.06	0.10
	GGG 40	30	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	90	0.1	0.3	0.06	0.07
	GGG 50	40	655.605	0.1	60	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		50	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		60	655.605	0.1	25	0.1	0.2	0.04	0.07	655.605	0.1	30	0.1	0.2	0.04	0.07
	GGG	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
	< 800 N/mm2	20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
	GGG 60	30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
	GGG 70	40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
	GGG 80	50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
N	Aluminium	10	655.601	0.2	120	0.1	0.3	0.06	0.12	655.601	0.2	180	0.1	0.3	0.06	0.12
	Wrought alloys	20	655.601	0.2	120	0.1	0.3	0.06	0.12	655.601	0.2	150	0.1	0.3	0.06	0.12
	Si < 10%	30	655.601	0.2	100	0.1	0.3	0.06	0.11	655.601	0.2	120	0.1	0.3	0.06	0.11
	3.1354	40	655.604	0.1	80	0.1	0.2	0.04	0.08	655.601	0.2	100	0.1	0.3	0.06	0.08
	3.2315	50	655.604	0.1	60	0.1	0.2	0.04	0.08	655.604	0.1	80	0.1	0.2	0.04	0.08
	3.3545	60	655.604	0.1	40	0.1	0.2	0.04	0.08	655.604	0.1	50	0.1	0.2	0.04	0.08
	3.4365															
	Aluminium	10	655.602	0.2	120	0.1	0.3	0.06	0.12	655.602	0.2	180	0.1	0.3	0.06	0.12
	Cast alloys	20	655.602	0.2	120	0.1	0.3	0.06	0.12	655.602	0.2	150	0.1	0.3	0.06	0.12
	Si > 10%	30	655.602	0.2	100	0.1	0.3	0.06	0.11	655.602	0.2	120	0.1	0.3	0.06	0.11
	G-AlSi 12	40	655.606	0.1	80	0.1	0.2	0.04	0.08	655.602	0.2	100	0.1	0.2	0.06	0.08
	G-AlSi17Cu4Mg	50	655.606	0.1	60	0.1	0.2	0.04	0.08	655.606	0.1	80	0.1	0.2	0.04	0.08
		60	655.606	0.1	40	0.1	0.2	0.04	0.08	655.606	0.1	50	0.1	0.2	0.04	0.08
S		10	655.602	0.2	90	0.1	0.3	0.06	0.10	655.602	0.2	100	0.1	0.3	0.06	0.10
	Titanium	20	655.602	0.2	70	0.1	0.3	0.06	0.10	655.602	0.2	80	0.1	0.3	0.06	0.10
	3.7164	30	655.606	0.1	60	0.1	0.2	0.04	0.07	655.602	0.2	70	0.1	0.3	0.06	0.07
		40	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	60	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
		10	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
	Ni-basic-,	20	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
	Co-basic-,	30	655.606	0.1	30	0.1	0.2	0.04	0.06	655.602	0.2	30	0.1	0.2	0.06	0.06
	Alloys	40	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
		50	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 7.3 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended



EWN 04-22

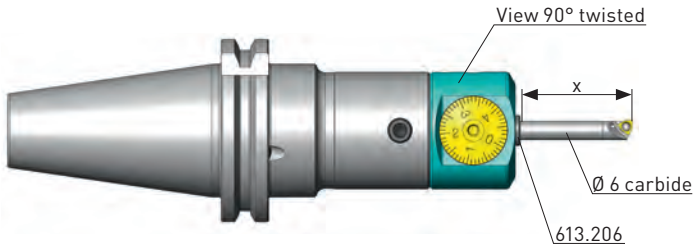


EWE 2-32

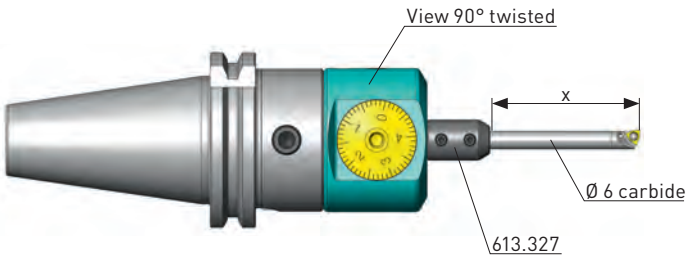
	Workpiece material	Boring depth	universal Ø 7.3 - 11.3 mm							optimized Ø 7.3 - 7.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	655.602	0.2	120	0.1	0.3	0.06	0.10	655.602	0.2	180	0.1	0.3	0.06	0.10
		20	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	140	0.1	0.3	0.06	0.10
		30	655.602	0.2	80	0.1	0.3	0.06	0.09	655.602	0.2	100	0.1	0.3	0.06	0.09
		40	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	80	0.1	0.3	0.06	0.07
		50	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		60	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	35	0.1	0.2	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	655.602	0.2	120	0.1	0.3	0.06	0.10	655.602	0.2	180	0.1	0.3	0.06	0.10
		20	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	140	0.1	0.3	0.06	0.10
		30	655.602	0.2	80	0.1	0.3	0.06	0.09	655.602	0.2	100	0.1	0.3	0.06	0.09
		40	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	80	0.1	0.3	0.06	0.07
		50	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		60	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	35	0.1	0.2	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	110	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	90	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	10	655.603	0.2	120	0.1	0.4	0.06	0.10	655.603	0.2	180	0.1	0.4	0.06	0.10
		20	655.603	0.2	100	0.1	0.4	0.06	0.10	655.603	0.2	140	0.1	0.4	0.06	0.10
		30	655.603	0.2	80	0.1	0.4	0.06	0.10	655.603	0.2	100	0.1	0.4	0.06	0.10
		40	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	80	0.1	0.4	0.06	0.07
		50	655.605	0.1	50	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		60	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		65	655.605	0.1	30	0.1	0.2	0.04	0.07	655.605	0.1	35	0.1	0.2	0.04	0.07

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used. For the EWN 04-22 only short reducers are available.



EWN 04-22

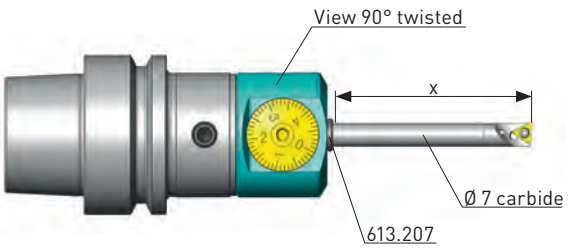


EWN 2-32

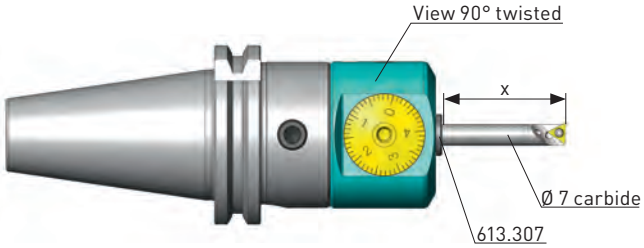
	Workpiece material	Boring depth	universal Ø 7.3 - 11.3 mm							optimized Ø 7.3 - 7.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	10	655.603	0.2	120	0.1	0.3	0.06	0.10	655.603	0.2	180	0.1	0.3	0.06	0.10
		20	655.603	0.2	100	0.1	0.3	0.06	0.10	655.603	0.2	140	0.1	0.3	0.06	0.10
		30	655.603	0.2	80	0.1	0.3	0.06	0.09	655.603	0.2	100	0.1	0.3	0.06	0.09
		40	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	80	0.1	0.3	0.06	0.07
		50	655.605	0.1	50	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		60	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		65	655.605	0.1	30	0.1	0.2	0.04	0.07	655.605	0.1	35	0.1	0.2	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	10	655.601	0.2	140	0.1	0.3	0.06	0.12	655.601	0.2	200	0.1	0.3	0.06	0.12
		20	655.601	0.2	130	0.1	0.3	0.06	0.12	655.601	0.2	180	0.1	0.3	0.06	0.12
		30	655.601	0.2	110	0.1	0.3	0.06	0.10	655.601	0.2	150	0.1	0.3	0.06	0.10
		40	655.601	0.2	90	0.1	0.2	0.06	0.10	655.601	0.2	120	0.1	0.3	0.06	0.10
		50	655.604	0.1	70	0.1	0.2	0.04	0.07	655.601	0.2	100	0.1	0.3	0.06	0.07
		60	655.604	0.1	60	0.1	0.2	0.04	0.07	655.604	0.1	80	0.1	0.2	0.04	0.07
		65	655.604	0.1	50	0.1	0.2	0.04	0.07	655.604	0.1	50	0.1	0.2	0.04	0.07
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	10	655.602	0.2	140	0.1	0.3	0.06	0.12	655.602	0.2	200	0.1	0.3	0.06	0.12
		20	655.602	0.2	130	0.1	0.3	0.06	0.12	655.602	0.2	180	0.1	0.3	0.06	0.12
		30	655.602	0.2	110	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
		40	655.602	0.2	90	0.1	0.2	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		50	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	100	0.1	0.3	0.06	0.07
		60	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	80	0.1	0.2	0.04	0.07
		65	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
S	Titanium 3.7164	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	100	0.1	0.3	0.06	0.10
		30	655.602	0.2	60	0.1	0.3	0.06	0.09	655.602	0.2	80	0.1	0.3	0.06	0.09
		40	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	60	0.1	0.2	0.04	0.07
		60	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	10	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		20	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		30	655.602	0.2	30	0.1	0.2	0.06	0.06	655.602	0.2	30	0.1	0.2	0.06	0.06
		40	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
		50	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 7.8 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended



EWN 04-22

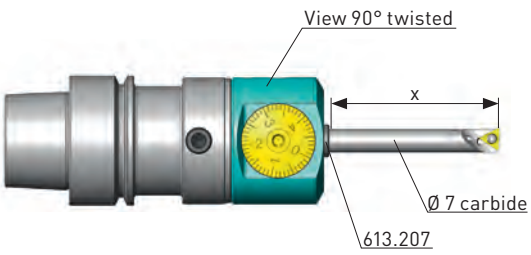


EWN 2-32

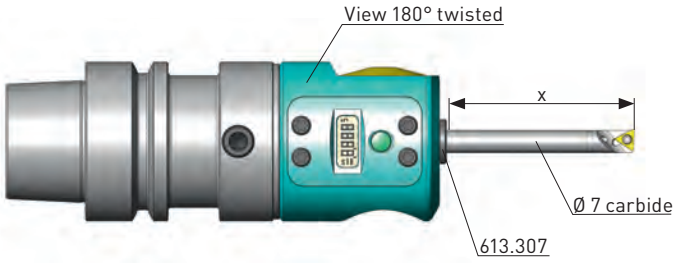
	Workpiece material	Boring depth	universal Ø 7.8 - 11.8 mm							optimized Ø 7.8 - 8.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.738	0.3	180	0.1	0.5	0.08	0.12
		30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.738	0.3	150	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	110	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.738	0.3	180	0.1	0.5	0.08	0.12
		30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.738	0.3	150	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	110	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
		30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	120	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	20	651.837	0.2	120	0.1	0.6	0.06	0.12	651.735	0.3	180	0.1	0.6	0.08	0.12
		30	651.837	0.2	100	0.1	0.6	0.06	0.12	651.735	0.3	150	0.1	0.6	0.08	0.12
		40	651.837	0.2	90	0.1	0.6	0.06	0.10	651.735	0.3	110	0.1	0.6	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.4	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used.



EWN 04-22

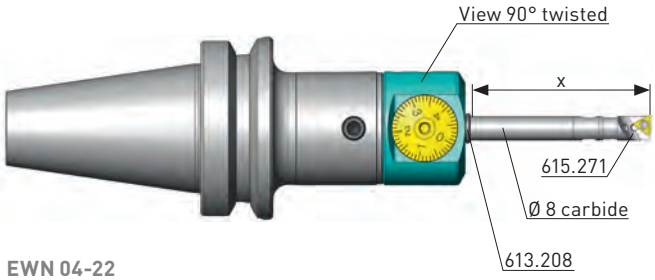


EWE 2-32

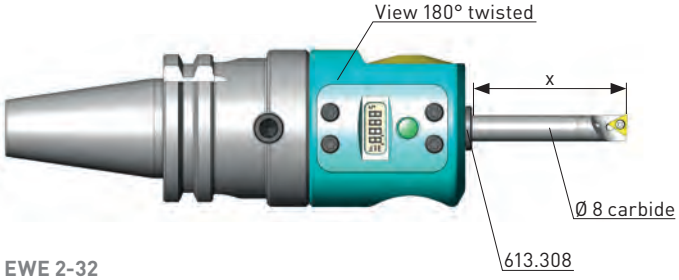
	Workpiece material	Boring depth	universal Ø 7.8 - 11.8 mm							optimized Ø 7.8 - 8.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.735	0.3	180	0.1	0.5	0.08	0.12
		30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.735	0.3	150	0.1	0.5	0.08	0.12
		40	651.837	0.2	90	0.1	0.4	0.06	0.10	651.735	0.3	110	0.1	0.5	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.825	0.2	150	0.1	0.5	0.06	0.14	651.723	0.3	220	0.1	0.5	0.08	0.14
		30	651.825	0.2	130	0.1	0.5	0.06	0.14	651.723	0.3	200	0.1	0.5	0.08	0.14
		40	651.825	0.2	110	0.1	0.5	0.06	0.12	651.723	0.3	180	0.1	0.5	0.08	0.12
		50	651.823	0.1	90	0.1	0.4	0.04	0.12	651.825	0.2	130	0.1	0.4	0.06	0.12
		60	651.823	0.1	70	0.1	0.3	0.04	0.10	651.825	0.2	100	0.1	0.4	0.06	0.10
		70	651.823	0.1	60	0.1	0.3	0.04	0.08	651.823	0.1	70	0.1	0.3	0.04	0.08
		75	651.823	0.1	40	0.1	0.3	0.04	0.08	651.823	0.1	40	0.1	0.3	0.04	0.08
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.837	0.2	150	0.1	0.5	0.06	0.14	651.737	0.3	220	0.1	0.5	0.08	0.14
		30	651.837	0.2	130	0.1	0.5	0.06	0.14	651.737	0.3	200	0.1	0.5	0.08	0.14
		40	651.837	0.2	110	0.1	0.5	0.06	0.12	651.737	0.3	180	0.1	0.5	0.08	0.12
		50	651.824	0.1	90	0.1	0.4	0.04	0.12	651.837	0.2	130	0.1	0.4	0.06	0.12
		60	651.824	0.1	70	0.1	0.3	0.04	0.10	651.837	0.2	100	0.1	0.4	0.06	0.10
		70	651.824	0.1	60	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		75	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	40	0.1	0.3	0.04	0.08
S	Titanium 3.7164	20	651.837	0.2	100	0.1	0.5	0.06	0.12	651.737	0.3	120	0.1	0.5	0.08	0.12
		30	651.837	0.2	80	0.1	0.5	0.06	0.12	651.737	0.3	100	0.1	0.5	0.08	0.12
		40	651.824	0.1	60	0.1	0.4	0.04	0.10	651.837	0.2	80	0.1	0.4	0.06	0.10
		50	651.824	0.1	50	0.1	0.4	0.04	0.10	651.837	0.2	70	0.1	0.4	0.06	0.10
		60	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	60	0.1	0.3	0.04	0.08
		70	651.824	0.1	30	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		30	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		40	651.824	0.1	30	0.1	0.3	0.04	0.08	651.839	0.2	30	0.1	0.3	0.06	0.08
		50	651.824	0.1	30	0.1	0.3	0.04	0.08	651.824	0.1	30	0.1	0.3	0.04	0.08
		60	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 8.8 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended



EWN 04-22

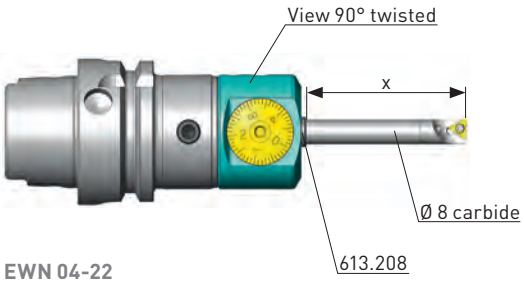


EWE 2-32

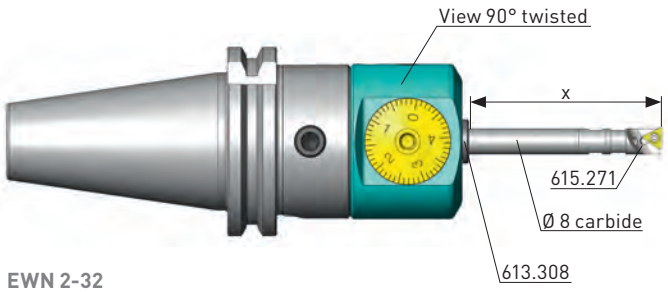
	Workpiece material	Boring depth	universal Ø 8.8 - 12.8 mm							optimized Ø 8.8 - 10.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.738	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.738	0.3	160	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	120	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.738	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.738	0.3	160	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	120	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	130	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	20	651.837	0.2	130	0.1	0.6	0.06	0.12	651.735	0.3	200	0.1	0.6	0.08	0.12
		30	651.837	0.2	110	0.1	0.6	0.06	0.12	651.735	0.3	160	0.1	0.6	0.08	0.12
		40	651.837	0.2	90	0.1	0.6	0.06	0.10	651.735	0.3	120	0.1	0.6	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.4	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data for the fine boring heads EWN 04-22 and EWN/EWE 2-32 are the same. On all boring heads the same tool holders will be used.



EWN 04-22

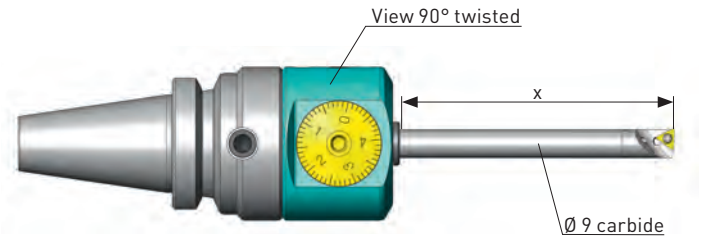


EWN 2-32

	Workpiece material	Boring depth	universal Ø 8.8 - 12.8 mm							optimized Ø 8.8 - 10.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.735	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.735	0.3	160	0.1	0.5	0.08	0.12
		40	651.837	0.2	90	0.1	0.4	0.06	0.10	651.735	0.3	120	0.1	0.5	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.825	0.2	180	0.1	0.5	0.06	0.14	651.723	0.3	260	0.1	0.5	0.08	0.14
		30	651.825	0.2	170	0.1	0.5	0.06	0.14	651.723	0.3	260	0.1	0.5	0.08	0.14
		40	651.825	0.2	150	0.1	0.5	0.06	0.12	651.723	0.3	200	0.1	0.5	0.08	0.12
		50	651.823	0.1	120	0.1	0.4	0.04	0.12	651.825	0.2	150	0.1	0.4	0.06	0.12
		60	651.823	0.1	80	0.1	0.3	0.04	0.10	651.825	0.2	120	0.1	0.4	0.06	0.1
		70	651.823	0.1	70	0.1	0.3	0.04	0.08	651.823	0.1	80	0.1	0.3	0.04	0.08
		75	651.823	0.1	60	0.1	0.3	0.04	0.08	651.823	0.1	70	0.1	0.3	0.04	0.08
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.837	0.2	180	0.1	0.5	0.06	0.14	651.737	0.3	260	0.1	0.5	0.08	0.14
		30	651.837	0.2	170	0.1	0.5	0.06	0.14	651.737	0.3	260	0.1	0.5	0.08	0.14
		40	651.837	0.2	150	0.1	0.5	0.06	0.12	651.737	0.3	200	0.1	0.5	0.08	0.12
		50	651.824	0.1	120	0.1	0.4	0.04	0.12	651.837	0.2	150	0.1	0.4	0.06	0.12
		60	651.824	0.1	80	0.1	0.3	0.04	0.10	651.837	0.2	120	0.1	0.4	0.06	0.1
		70	651.824	0.1	70	0.1	0.3	0.04	0.08	651.824	0.1	80	0.1	0.3	0.04	0.08
		75	651.824	0.1	60	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
S	Titanium 3.7164	20	651.837	0.2	100	0.1	0.5	0.06	0.12	651.737	0.3	120	0.1	0.5	0.08	0.12
		30	651.837	0.2	80	0.1	0.5	0.06	0.12	651.737	0.3	100	0.1	0.5	0.08	0.12
		40	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	80	0.1	0.4	0.06	0.10
		50	651.824	0.1	60	0.1	0.4	0.04	0.10	651.837	0.2	70	0.1	0.4	0.06	0.10
		60	651.824	0.1	50	0.1	0.3	0.04	0.08	651.824	0.1	60	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	40	0.1	0.3	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		30	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		40	651.824	0.1	30	0.1	0.3	0.04	0.08	651.839	0.2	30	0.1	0.3	0.06	0.08
		50	651.824	0.1	30	0.1	0.3	0.04	0.08	651.839	0.2	30	0.1	0.3	0.04	0.08
		60	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06

When applying the optimized cutting data:

- the boring diameter of 10.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

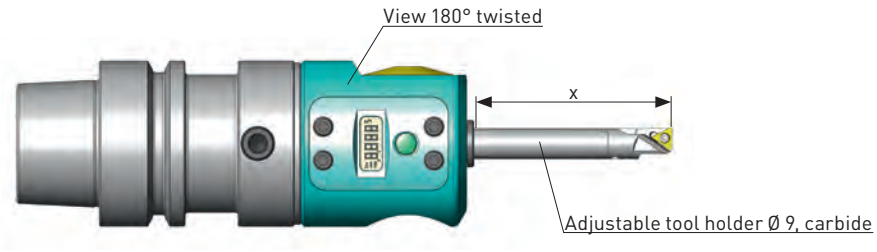


EWN 2-32, universal

	Workpiece material	Boring depth	universal Ø 10.0 - 14.0 mm							optimized Ø 9.8 - 12.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	35	651.837	0.2	110	0.2	0.6	0.06	0.14	651.738	0.3	160	0.2	0.6	0.08	0.14
	< 450 N/mm2	45	651.837	0.2	90	0.2	0.6	0.06	0.12	651.738	0.3	120	0.2	0.6	0.08	0.12
		55	651.824	0.1	70	0.2	0.4	0.04	0.12	651.838	0.2	100	0.2	0.4	0.06	0.12
	1.0037	70	651.824	0.1	55	0.2	0.4	0.04	0.10	651.838	0.2	70	0.2	0.4	0.06	0.10
	1.0401	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	1.0715	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Steel	35	651.837	0.2	110	0.2	0.6	0.06	0.14	651.738	0.3	160	0.2	0.6	0.08	0.14
	450-850 N/mm2	45	651.837	0.2	90	0.2	0.6	0.06	0.12	651.738	0.3	120	0.2	0.6	0.08	0.12
	1.0050	55	651.824	0.1	70	0.2	0.4	0.04	0.12	651.838	0.2	100	0.2	0.4	0.06	0.12
	1.0503	70	651.824	0.1	55	0.2	0.4	0.04	0.10	651.838	0.2	70	0.2	0.4	0.06	0.10
	1.1141	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	1.1191	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	1.5752															
	Steel	35	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
	850-1200 N/mm2	45	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
	1.2083	55	651.824	0.1	70	0.2	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
	1.2294	70	651.824	0.1	55	0.2	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
	1.2312	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	1.2344	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	1.2764															
M	Stainless steels,	35	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
	ferritic,	45	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
	martensitic	55	651.824	0.1	70	0.2	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
	1.4016	70	651.824	0.1	55	0.2	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
	1.4024	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	1.4034	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	1.4762															
	Stainless steels,	35	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	130	0.2	0.6	0.08	0.12
	austenitic	45	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	110	0.2	0.6	0.08	0.10
	1.4301	55	651.824	0.1	70	0.2	0.4	0.04	0.10	651.837	0.2	90	0.2	0.4	0.06	0.10
	1.4311	70	651.824	0.1	55	0.2	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
	1.4401	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	1.4435	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	1.4571															
K	Gray cast iron	35	651.837	0.2	110	0.2	0.8	0.06	0.14	651.735	0.3	160	0.2	0.8	0.08	0.14
		45	651.837	0.2	90	0.2	0.6	0.06	0.12	651.735	0.3	120	0.2	0.6	0.08	0.12
	GG 15	55	651.824	0.1	70	0.2	0.6	0.04	0.10	651.834	0.2	100	0.2	0.6	0.06	0.12
	GG 20	70	651.824	0.1	55	0.2	0.4	0.04	0.10	651.834	0.2	70	0.2	0.4	0.06	0.10
	GG 25	85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	GG 30	100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories.



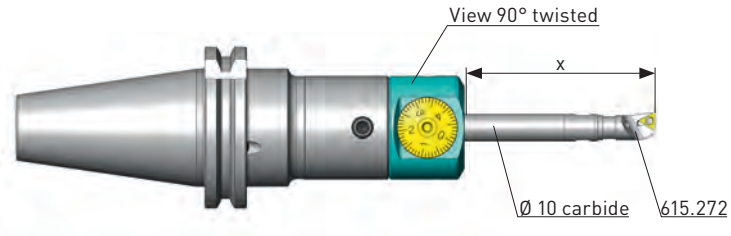
EWE 2-32, optimized

	Workpiece material	Boring depth	universal Ø 10.0 - 14.0 mm							optimized Ø 9.8 - 12.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	35	651.837	0.2	110	0.2	0.6	0.06	0.14	651.735	0.3	160	0.2	0.6	0.08	0.14
		45	651.837	0.2	90	0.2	0.6	0.06	0.12	651.735	0.3	120	0.2	0.6	0.08	0.12
		55	651.824	0.1	70	0.2	0.4	0.04	0.12	651.834	0.2	100	0.2	0.4	0.06	0.12
		70	651.824	0.1	55	0.2	0.4	0.04	0.10	651.834	0.2	70	0.2	0.4	0.06	0.10
		85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
		100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	35	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
		45	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
		55	651.824	0.1	70	0.2	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	55	0.2	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
		85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
		100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	35	651.825	0.2	170	0.2	0.6	0.06	0.16	651.723	0.3	260	0.2	0.6	0.08	0.16
		45	651.825	0.2	140	0.2	0.6	0.06	0.14	651.723	0.3	200	0.2	0.6	0.08	0.14
		55	651.825	0.2	110	0.2	0.5	0.06	0.14	651.723	0.3	160	0.2	0.5	0.08	0.14
		70	651.823	0.1	80	0.2	0.4	0.04	0.12	651.825	0.2	120	0.2	0.4	0.06	0.12
		85	651.823	0.1	60	0.2	0.4	0.04	0.12	651.823	0.1	80	0.2	0.4	0.04	0.12
		100	651.823	0.1	40	0.2	0.4	0.04	0.10	651.823	0.1	40	0.2	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	35	651.837	0.2	170	0.2	0.6	0.06	0.16	651.737	0.3	260	0.2	0.6	0.08	0.16
		45	651.837	0.2	140	0.2	0.6	0.06	0.14	651.737	0.3	200	0.2	0.6	0.08	0.14
		55	651.837	0.2	110	0.2	0.5	0.06	0.14	651.737	0.3	160	0.2	0.5	0.08	0.14
		70	651.824	0.1	80	0.2	0.4	0.04	0.12	651.837	0.2	120	0.2	0.4	0.06	0.12
		85	651.824	0.1	60	0.2	0.4	0.04	0.12	651.824	0.1	80	0.2	0.4	0.04	0.12
		100	651.824	0.1	40	0.2	0.4	0.04	0.10	651.824	0.1	40	0.2	0.4	0.04	0.10
S	Titanium 3.7164	35	651.837	0.2	80	0.2	0.6	0.06	0.14	651.737	0.3	100	0.2	0.6	0.08	0.14
		45	651.837	0.2	70	0.2	0.6	0.06	0.12	651.837	0.2	80	0.2	0.6	0.06	0.12
		55	651.824	0.1	60	0.2	0.4	0.04	0.12	651.837	0.2	70	0.2	0.4	0.06	0.12
		70	651.824	0.1	50	0.2	0.4	0.04	0.10	651.824	0.1	60	0.2	0.4	0.04	0.10
		85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	40	0.2	0.4	0.04	0.08
		100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	35	651.839	0.2	50	0.2	0.5	0.06	0.12	651.839	0.2	50	0.2	0.5	0.06	0.12
		45	651.839	0.2	30	0.2	0.5	0.06	0.10	651.839	0.2	30	0.2	0.5	0.06	0.10
		55	651.824	0.1	30	0.2	0.4	0.04	0.08	651.839	0.2	30	0.2	0.4	0.06	0.08
		70	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 12.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

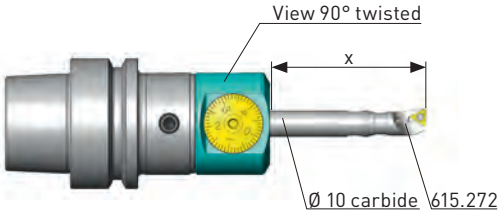


EWN 04-22

	Workpiece material	Boring depth	universal Ø 11.8 - 15.8mm							optimized Ø 11.8 - 13.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	20	651.837	0.2	150	0.2	0.8	0.06	0.14	651.738	0.3	200	0.2	0.8	0.08	0.14
		30	651.837	0.2	150	0.2	0.8	0.06	0.14	651.738	0.3	180	0.2	0.8	0.08	0.14
		40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.738	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	120	0.2	0.6	0.06	0.12
		60	651.824	0.1	90	0.2	0.4	0.04	0.10	651.838	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	20	651.837	0.2	150	0.2	0.8	0.06	0.14	651.738	0.3	200	0.2	0.8	0.08	0.14
		30	651.837	0.2	150	0.2	0.8	0.06	0.14	651.738	0.3	180	0.2	0.8	0.08	0.14
		40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.738	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	120	0.2	0.6	0.06	0.12
		60	651.824	0.1	90	0.2	0.4	0.04	0.10	651.838	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	20	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	180	0.2	0.8	0.08	0.12
		30	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	160	0.2	0.8	0.08	0.12
		40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
		50	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		60	651.824	0.1	90	0.2	0.4	0.04	0.08	651.837	0.2	100	0.2	0.4	0.06	0.08
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	20	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	180	0.2	0.8	0.08	0.12
		30	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	160	0.2	0.8	0.08	0.12
		40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
		50	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		60	651.824	0.1	90	0.2	0.4	0.04	0.08	651.837	0.2	100	0.2	0.4	0.06	0.08
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	20	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	160	0.2	0.8	0.08	0.12
		30	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	140	0.2	0.8	0.08	0.12
		40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	130	0.2	0.6	0.08	0.10
		50	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		60	651.824	0.1	90	0.2	0.4	0.04	0.08	651.837	0.2	100	0.2	0.4	0.06	0.08
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	20	651.837	0.2	150	0.2	0.8	0.06	0.14	651.735	0.3	200	0.2	0.8	0.08	0.14
		30	651.837	0.2	150	0.2	0.8	0.06	0.14	651.735	0.3	180	0.2	0.8	0.08	0.14
		40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.735	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	120	0.2	0.6	0.06	0.12
		60	651.824	0.1	90	0.2	0.4	0.04	0.10	651.834	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring head EWN 04-22 and the corresponding accessories.

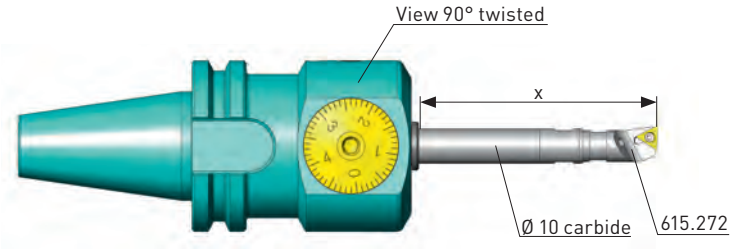


EWN 04-22

	Workpiece material	Boring depth	universal Ø 11.8 - 15.8 mm							optimized Ø 11.8 - 13.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.837	0.2	150	0.2	0.8	0.06	0.14	651.735	0.3	200	0.2	0.8	0.08	0.14
		30	651.837	0.2	150	0.2	0.8	0.06	0.14	651.735	0.3	180	0.2	0.8	0.08	0.14
		40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.735	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	120	0.2	0.6	0.06	0.12
		60	651.824	0.1	90	0.2	0.4	0.04	0.10	651.834	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	180	0.2	0.8	0.08	0.12
		30	651.837	0.2	150	0.2	0.8	0.06	0.12	651.737	0.3	160	0.2	0.8	0.08	0.12
		40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
		50	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		60	651.824	0.1	90	0.2	0.4	0.04	0.08	651.837	0.2	100	0.2	0.4	0.06	0.08
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.825	0.2	180	0.2	0.8	0.06	0.16	651.723	0.3	300	0.2	0.8	0.08	0.16
		30	651.825	0.2	180	0.2	0.8	0.06	0.16	651.723	0.3	300	0.2	0.8	0.08	0.16
		40	651.825	0.2	180	0.2	0.6	0.06	0.14	651.723	0.3	250	0.2	0.6	0.08	0.14
		50	651.825	0.2	160	0.2	0.6	0.06	0.14	651.723	0.3	200	0.2	0.6	0.08	0.14
		60	651.823	0.1	140	0.2	0.4	0.04	0.12	651.825	0.2	180	0.2	0.4	0.06	0.12
		70	651.823	0.1	100	0.2	0.4	0.04	0.12	651.825	0.2	120	0.2	0.4	0.06	0.12
		80	651.823	0.1	60	0.2	0.4	0.04	0.10	651.823	0.1	80	0.2	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.837	0.2	180	0.2	0.8	0.06	0.16	651.737	0.3	300	0.2	0.8	0.08	0.16
		30	651.837	0.2	180	0.2	0.8	0.06	0.16	651.737	0.3	300	0.2	0.8	0.08	0.16
		40	651.837	0.2	180	0.2	0.6	0.06	0.14	651.737	0.3	250	0.2	0.6	0.08	0.14
		50	651.837	0.2	160	0.2	0.6	0.06	0.14	651.737	0.3	200	0.2	0.6	0.08	0.14
		60	651.824	0.1	140	0.2	0.4	0.04	0.12	651.837	0.2	180	0.2	0.4	0.06	0.12
		70	651.824	0.1	100	0.2	0.4	0.04	0.12	651.837	0.2	120	0.2	0.4	0.06	0.12
		80	651.824	0.1	60	0.2	0.4	0.04	0.10	651.824	0.1	80	0.2	0.4	0.04	0.10
S	Titanium 3.7164	20	651.837	0.2	120	0.2	0.8	0.06	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		30	651.837	0.2	120	0.2	0.8	0.06	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		40	651.837	0.2	100	0.2	0.6	0.06	0.12	651.737	0.3	100	0.2	0.6	0.06	0.12
		50	651.837	0.2	100	0.2	0.6	0.06	0.12	651.837	0.2	100	0.2	0.6	0.06	0.12
		60	651.824	0.1	80	0.2	0.4	0.04	0.10	651.837	0.2	80	0.2	0.4	0.04	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		80	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	40	0.2	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.2	0.8	0.06	0.12	651.839	0.2	50	0.2	0.8	0.06	0.12
		30	651.839	0.2	50	0.2	0.8	0.06	0.12	651.839	0.2	50	0.2	0.8	0.06	0.12
		40	651.839	0.2	40	0.2	0.6	0.06	0.10	651.839	0.2	40	0.2	0.6	0.06	0.10
		50	651.824	0.1	30	0.2	0.6	0.04	0.08	651.839	0.2	30	0.2	0.6	0.06	0.08
		60	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
		70	651.824	0.1	20	0.2	0.4	0.04	0.08	651.824	0.1	20	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

- the boring diameter of 13.8 mm may not be exceeded
- the use of a fine balanced tool shank

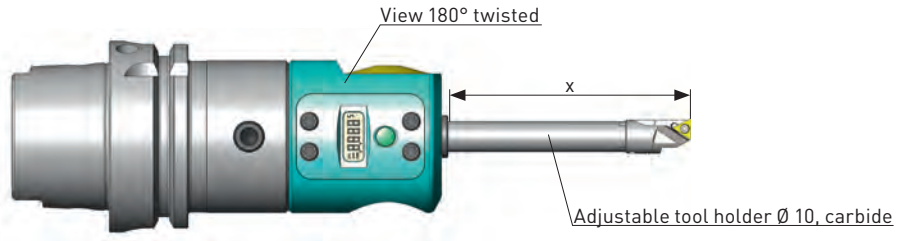


EWN 2-32, universal

	Workpiece material	Boring depth	universal Ø 11.8 - 15.8 mm							optimized Ø 11.8 - 14.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	20	651.737	0.3	150	0.2	0.8	0.08	0.14							
P	< 450 N/mm2	30	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	230	0.2	0.8	0.08	0.14
P		40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.738	0.3	210	0.2	0.8	0.08	0.12
P	1.0037	55	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
P	1.0401	70	651.824	0.1	70	0.2	0.4	0.04	0.10	651.838	0.2	130	0.2	0.6	0.06	0.10
P	1.0715	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
P		100								651.824	0.1	40	0.2	0.4	0.04	0.08
P	Steel	20	651.737	0.3	150	0.2	0.8	0.08	0.14							
P	450-850 N/mm2	30	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	230	0.2	0.8	0.08	0.14
P	1.0050	40	651.837	0.2	120	0.2	0.6	0.06	0.12	651.738	0.3	210	0.2	0.8	0.08	0.12
P	1.0503	55	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
P	1.1141	70	651.824	0.1	70	0.2	0.4	0.04	0.10	651.838	0.2	130	0.2	0.6	0.06	0.10
P	1.1191	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
P	1.5752	100								651.824	0.1	40	0.2	0.4	0.04	0.08
P	Steel	20	651.737	0.3	150	0.2	0.8	0.08	0.12							
P	850-1200 N/mm2	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	210	0.2	0.8	0.08	0.12
P	1.2083	40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
P	1.2294	55	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	150	0.2	0.6	0.06	0.10
P	1.2312	70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.837	0.2	130	0.2	0.6	0.06	0.08
P	1.2344	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
P	1.2764	100								651.824	0.1	40	0.2	0.4	0.04	0.08
M	Stainless steels,	20	651.737	0.3	150	0.2	0.8	0.08	0.12							
M	ferritic,	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	210	0.2	0.8	0.08	0.12
M	martensitic	40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
M	1.4016	55	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	150	0.2	0.6	0.06	0.10
M	1.4024	70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.837	0.2	130	0.2	0.6	0.06	0.08
M	1.4034	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
M	1.4762	100								651.824	0.1	40	0.2	0.4	0.04	0.08
M	Stainless steels,	20	651.737	0.3	150	0.2	0.8	0.08	0.12							
M	austenitic	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	190	0.2	0.8	0.08	0.12
M	1.4301	40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	170	0.2	0.8	0.08	0.10
M	1.4311	55	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	150	0.2	0.6	0.06	0.10
M	1.4401	70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.837	0.2	130	0.2	0.6	0.06	0.08
M	1.4435	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
M	1.4571	100								651.824	0.1	40	0.2	0.4	0.04	0.08
K	Gray cast iron	20	651.735	0.3	150	0.2	0.8	0.08	0.14							
K		30	651.735	0.3	150	0.2	0.8	0.08	0.14	651.735	0.3	230	0.2	0.8	0.08	0.14
K	GG 15	40	651.834	0.2	120	0.2	0.6	0.06	0.12	651.735	0.3	210	0.2	0.8	0.08	0.12
K	GG 20	55	651.834	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	160	0.2	0.6	0.06	0.12
K	GG 25	70	651.824	0.1	70	0.2	0.4	0.04	0.10	651.834	0.2	130	0.2	0.6	0.06	0.10
K	GG 30	90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
K		100								651.824	0.1	40	0.2	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories.



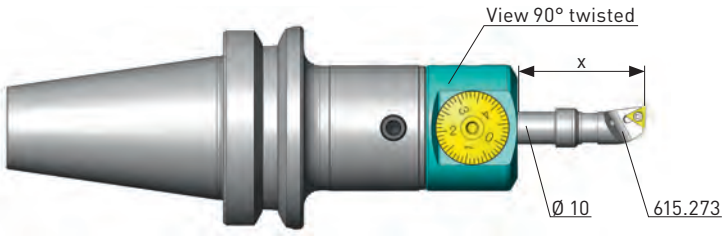
EWE 2-32, optimized

	Workpiece material	Boring depth	universal Ø 11.8 - 15.8 mm							optimized Ø 11.8 - 14.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.735	0.3	150	0.2	0.8	0.08	0.14							
		30	651.735	0.3	150	0.2	0.8	0.08	0.14	651.735	0.3	230	0.2	0.8	0.08	0.14
		40	651.834	0.2	120	0.2	0.6	0.06	0.12	651.735	0.3	210	0.2	0.8	0.08	0.12
		55	651.834	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	160	0.2	0.6	0.06	0.12
		70	651.824	0.1	70	0.2	0.4	0.04	0.10	651.834	0.2	130	0.2	0.6	0.06	0.10
		90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		100								651.824	0.1	40	0.2	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.737	0.3	150	0.2	0.8	0.08	0.12							
		30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	210	0.2	0.8	0.08	0.12
		40	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
		55	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	150	0.2	0.6	0.06	0.10
		70	651.824	0.1	70	0.2	0.4	0.04	0.08	651.837	0.2	130	0.2	0.6	0.06	0.08
		90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	80	0.2	0.4	0.04	0.08
		100								651.824	0.1	40	0.2	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.723	0.3	180	0.2	0.8	0.08	0.16							
		30	651.723	0.3	180	0.2	0.8	0.08	0.16	651.723	0.3	340	0.2	0.8	0.08	0.16
		40	651.723	0.3	180	0.2	0.6	0.08	0.14	651.723	0.3	320	0.2	0.8	0.08	0.14
		55	651.825	0.2	150	0.2	0.6	0.06	0.14	651.723	0.3	250	0.2	0.6	0.08	0.14
		70	651.825	0.2	100	0.2	0.4	0.06	0.12	651.825	0.2	180	0.2	0.6	0.06	0.12
		90	651.823	0.1	60	0.2	0.4	0.04	0.12	651.823	0.1	120	0.2	0.4	0.04	0.12
		100								651.823	0.1	70	0.2	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.737	0.3	180	0.2	0.8	0.08	0.16							
		30	651.737	0.3	180	0.2	0.8	0.08	0.16	651.737	0.3	340	0.2	0.8	0.08	0.16
		40	651.737	0.3	180	0.2	0.6	0.08	0.14	651.737	0.3	320	0.2	0.8	0.08	0.14
		55	651.837	0.2	150	0.2	0.6	0.06	0.14	651.737	0.3	250	0.2	0.6	0.08	0.14
		70	651.837	0.2	100	0.2	0.4	0.06	0.12	651.837	0.2	180	0.2	0.6	0.06	0.12
		90	651.824	0.1	60	0.2	0.4	0.04	0.12	651.824	0.1	120	0.2	0.4	0.04	0.12
		100								651.824	0.1	70	0.2	0.4	0.04	0.10
S	Titanium 3.7164	20	651.737	0.3	100	0.2	0.8	0.08	0.14							
		30	651.737	0.3	80	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		40	651.837	0.2	70	0.2	0.6	0.06	0.12	651.737	0.3	100	0.2	0.8	0.08	0.12
		55	651.837	0.2	60	0.2	0.6	0.06	0.12	651.837	0.2	80	0.2	0.6	0.06	0.12
		70	651.824	0.1	50	0.2	0.4	0.04	0.10	651.837	0.2	60	0.2	0.6	0.06	0.10
		90	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.2	0.4	0.04	0.08
		100								651.824	0.1	40	0.2	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.2	0.6	0.06	0.12							
		30	651.839	0.2	50	0.2	0.6	0.06	0.12	651.839	0.2	50	0.2	0.6	0.06	0.12
		40	651.839	0.2	40	0.2	0.6	0.06	0.10	651.839	0.2	50	0.2	0.6	0.06	0.10
		55	651.824	0.1	30	0.2	0.4	0.04	0.10	651.839	0.2	40	0.2	0.6	0.06	0.10
		70	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
		90	651.824	0.1	20	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 14.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

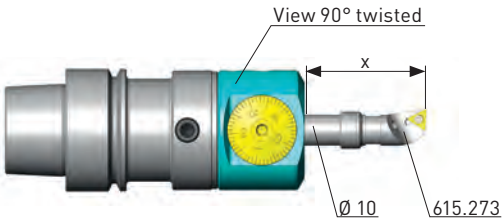


EWN 04-22

	Workpiece material	Boring depth	universal Ø 13.8 - 17.8 mm							optimized Ø 13.8 - 14.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	25	651.837	0.2	150	0.2	0.6	0.06	0.12	651.738	0.3	180	0.2	0.6	0.08	0.12
	< 450 N/mm2	35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.738	0.3	150	0.2	0.6	0.08	0.10
		40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.838	0.2	100	0.2	0.6	0.06	0.10
	1.0037	45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.838	0.2	60	0.2	0.6	0.06	0.10
	1.0401															
	1.0715															
	Steel	25	651.837	0.2	150	0.2	0.6	0.06	0.12	651.738	0.3	180	0.2	0.6	0.08	0.12
	450-850 N/mm2	35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.738	0.3	150	0.2	0.6	0.08	0.10
	1.0050	40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.838	0.2	100	0.2	0.6	0.06	0.10
	1.0503	45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.838	0.2	60	0.2	0.6	0.06	0.10
	1.1141															
	1.1191															
	1.5752															
	Steel	25	651.837	0.2	150	0.2	0.6	0.06	0.10	651.737	0.3	170	0.2	0.6	0.08	0.10
	850-1200 N/mm2	35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
	1.2083	40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.837	0.2	100	0.2	0.6	0.06	0.10
	1.2294	45	651.837	0.2	60	0.2	0.6	0.06	0.08	651.837	0.2	60	0.2	0.6	0.06	0.08
	1.2312															
	1.2344															
	1.2764															
M	Stainless steels,	25	651.837	0.2	150	0.2	0.6	0.06	0.10	651.737	0.3	170	0.2	0.6	0.08	0.10
	ferritic,	35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
	martensitic	40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.837	0.2	100	0.2	0.6	0.06	0.10
	1.4016	45	651.837	0.2	60	0.2	0.6	0.06	0.08	651.837	0.2	60	0.2	0.6	0.06	0.08
	1.4024															
	1.4034															
	1.4762															
	Stainless steels,	25	651.837	0.2	150	0.2	0.6	0.06	0.10	651.737	0.3	160	0.2	0.6	0.08	0.10
	austenitic	35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	130	0.2	0.6	0.08	0.10
	1.4301	40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.837	0.2	100	0.2	0.6	0.06	0.10
	1.4311	45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.837	0.2	60	0.2	0.6	0.06	0.10
	1.4401															
	1.4435															
	1.4571															
K	Gray cast iron	25	651.837	0.2	150	0.2	0.6	0.06	0.12	651.735	0.3	180	0.2	0.6	0.08	0.12
		35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.735	0.3	150	0.2	0.6	0.08	0.10
	GG 15	40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.834	0.2	100	0.2	0.6	0.06	0.10
	GG 20	45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.834	0.2	60	0.2	0.6	0.06	0.10
	GG 25															
	GG 30															

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring head EWN 04-22. The tool holder is made out of steel. The max boring depth is limited to 45 mm.

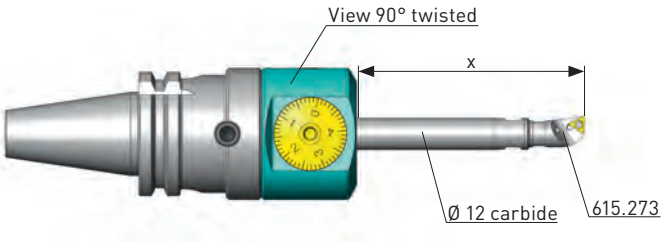


EWN 04-22

	Workpiece material	Boring depth	universal Ø 13.8 - 17.8 mm							optimized Ø 13.8 - 14.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	25	651.837	0.2	150	0.2	0.6	0.06	0.12	651.735	0.3	180	0.2	0.6	0.08	0.12
		35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.735	0.3	150	0.2	0.6	0.08	0.10
		40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.834	0.2	100	0.2	0.6	0.06	0.10
		45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.834	0.2	60	0.2	0.6	0.06	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	25	651.837	0.2	150	0.2	0.6	0.06	0.10	651.737	0.3	170	0.2	0.6	0.08	0.10
		35	651.837	0.2	120	0.2	0.6	0.06	0.10	651.737	0.3	140	0.2	0.6	0.08	0.10
		40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.837	0.2	100	0.2	0.6	0.06	0.10
		45	651.837	0.2	60	0.2	0.6	0.06	0.08	651.837	0.2	60	0.2	0.6	0.06	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	25	651.825	0.2	150	0.2	0.6	0.06	0.15	651.723	0.3	200	0.2	0.6	0.08	0.15
		35	651.825	0.2	120	0.2	0.6	0.06	0.12	651.723	0.3	170	0.2	0.6	0.08	0.12
		40	651.825	0.2	90	0.2	0.6	0.06	0.10	651.723	0.3	120	0.2	0.6	0.08	0.10
		45	651.825	0.2	60	0.2	0.6	0.06	0.10	651.825	0.2	70	0.2	0.6	0.06	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	25	651.837	0.2	150	0.2	0.6	0.06	0.15	651.737	0.3	200	0.2	0.6	0.08	0.15
		35	651.837	0.2	120	0.2	0.6	0.06	0.12	651.737	0.3	170	0.2	0.6	0.08	0.12
		40	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
		45	651.837	0.2	60	0.2	0.6	0.06	0.10	651.837	0.2	70	0.2	0.6	0.06	0.10
S	Titanium 3.7164	25	651.837	0.2	100	0.2	0.6	0.06	0.12	651.737	0.3	100	0.2	0.6	0.08	0.12
		35	651.837	0.2	80	0.2	0.6	0.06	0.10	651.737	0.3	80	0.2	0.6	0.08	0.10
		40	651.837	0.2	70	0.2	0.6	0.06	0.10	651.837	0.2	70	0.2	0.6	0.06	0.10
		45	651.837	0.2	50	0.2	0.6	0.06	0.10	651.837	0.2	50	0.2	0.6	0.06	0.10
	Ni-basic-, Co-basic-, Alloys	25	651.839	0.2	30	0.2	0.6	0.06	0.10	651.839	0.2	30	0.2	0.6	0.06	0.10
		35	651.839	0.2	30	0.2	0.6	0.06	0.10	651.839	0.2	30	0.2	0.6	0.06	0.10
		40	651.839	0.2	25	0.2	0.6	0.06	0.10	651.839	0.2	25	0.2	0.6	0.06	0.10
		45	651.839	0.2	20	0.2	0.6	0.06	0.08	651.839	0.2	20	0.2	0.6	0.06	0.08

When applying the optimized cutting data:

- the boring diameter of 14.8 mm may not be exceeded.

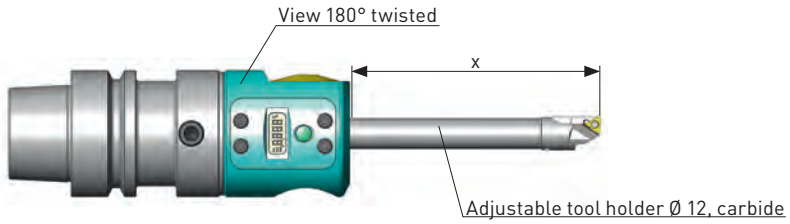


EWN 2-32, universal

	Workpiece material	Boring depth	universal Ø 13.8 - 17.8 mm							optimized Ø 13.8 - 17.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	35	651.737	0.3	170	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		45	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	220	0.2	0.8	0.08	0.14
		60	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	200	0.2	0.8	0.08	0.12
		75	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
		90	651.837	0.2	80	0.2	0.6	0.06	0.10	651.838	0.2	120	0.2	0.6	0.06	0.10
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	35	651.737	0.3	170	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		45	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	220	0.2	0.8	0.08	0.14
		60	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	200	0.2	0.8	0.08	0.12
		75	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
		90	651.837	0.2	80	0.2	0.6	0.06	0.10	651.838	0.2	120	0.2	0.6	0.06	0.10
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	35	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	200	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	180	0.2	0.8	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		90	651.837	0.2	80	0.2	0.6	0.06	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	35	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	200	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	180	0.2	0.8	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		90	651.837	0.2	80	0.2	0.6	0.06	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	35	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	200	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	180	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	160	0.2	0.8	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	140	0.2	0.6	0.06	0.10
		90	651.837	0.2	80	0.2	0.6	0.06	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	35	651.735	0.3	170	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		45	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	220	0.2	0.8	0.10	0.14
		60	651.735	0.3	125	0.2	0.6	0.08	0.12	651.735	0.3	200	0.2	0.8	0.08	0.12
		75	651.834	0.2	100	0.2	0.6	0.06	0.12	651.735	0.3	160	0.2	0.6	0.08	0.12
		90	651.834	0.2	80	0.2	0.6	0.06	0.10	651.834	0.2	120	0.2	0.6	0.06	0.10
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.834	0.2	70	0.2	0.4	0.06	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories.



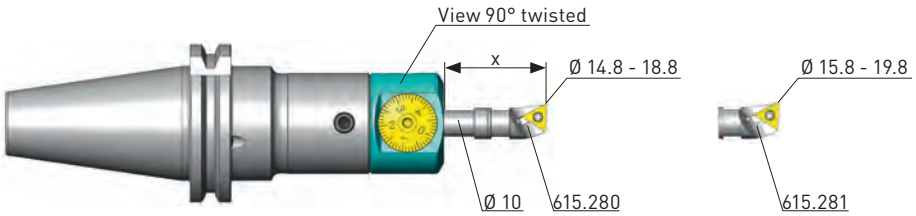
EWE 2-32, optimized

	Workpiece material	Boring depth	universal Ø 13.8 - 17.8 mm							optimized Ø 13.8 - 17.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	35	651.735	0.3	170	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		45	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	220	0.2	0.8	0.10	0.14
		60	651.735	0.3	125	0.2	0.6	0.08	0.12	651.735	0.3	200	0.2	0.8	0.08	0.12
		75	651.834	0.2	100	0.2	0.6	0.06	0.12	651.735	0.3	160	0.2	0.6	0.08	0.12
		90	651.834	0.2	80	0.2	0.6	0.06	0.10	651.834	0.2	120	0.2	0.6	0.06	0.10
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.834	0.2	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	35	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	200	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	180	0.2	0.8	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		90	651.837	0.2	80	0.2	0.6	0.06	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	70	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	35	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	380	0.2	0.8	0.10	0.16
		45	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	340	0.2	0.8	0.10	0.16
		60	651.723	0.3	180	0.2	0.8	0.08	0.14	651.723	0.3	280	0.2	0.8	0.08	0.14
		75	651.825	0.2	150	0.2	0.6	0.06	0.14	651.723	0.3	240	0.2	0.8	0.08	0.14
		90	651.825	0.2	110	0.2	0.6	0.06	0.12	651.825	0.2	190	0.2	0.6	0.06	0.12
		105	651.823	0.1	80	0.2	0.4	0.04	0.12	651.825	0.2	110	0.2	0.6	0.06	0.12
		120	651.823	0.1	40	0.2	0.4	0.04	0.10	651.823	0.1	50	0.2	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	35	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	380	0.2	0.8	0.08	0.16
		45	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	340	0.2	0.8	0.08	0.16
		60	651.737	0.3	180	0.2	0.8	0.08	0.14	651.737	0.3	280	0.2	0.8	0.08	0.14
		75	651.837	0.2	150	0.2	0.6	0.06	0.14	651.737	0.3	240	0.2	0.8	0.08	0.14
		90	651.837	0.2	110	0.2	0.6	0.06	0.12	651.837	0.2	190	0.2	0.6	0.06	0.12
		105	651.824	0.1	80	0.2	0.4	0.04	0.10	651.837	0.2	110	0.2	0.6	0.06	0.10
		120	651.824	0.1	40	0.2	0.4	0.04	0.10	651.824	0.1	50	0.2	0.4	0.04	0.10
S	Titanium 3.7164	35	651.737	0.3	120	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		45	651.737	0.3	120	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		60	651.837	0.2	100	0.2	0.6	0.06	0.12	651.837	0.2	120	0.2	0.6	0.06	0.12
		75	651.837	0.2	90	0.2	0.6	0.06	0.12	651.837	0.2	100	0.2	0.6	0.06	0.12
		90	651.824	0.1	80	0.2	0.4	0.04	0.10	651.824	0.1	80	0.2	0.4	0.04	0.10
		105	651.824	0.1	60	0.2	0.4	0.04	0.08	651.824	0.1	60	0.2	0.4	0.04	0.08
		120	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	35	651.839	0.2	50	0.2	0.8	0.06	0.12	651.839	0.2	50	0.2	0.8	0.06	0.12
		45	651.839	0.2	50	0.2	0.8	0.06	0.12	651.839	0.2	50	0.2	0.8	0.06	0.12
		60	651.839	0.2	50	0.2	0.6	0.06	0.10	651.839	0.2	50	0.2	0.6	0.06	0.10
		75	651.824	0.1	30	0.2	0.6	0.04	0.10	651.839	0.2	30	0.2	0.6	0.06	0.10
		90	651.824	0.1	30	0.2	0.4	0.04	0.08	651.824	0.1	30	0.2	0.4	0.04	0.08
		105	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	25	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 17.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

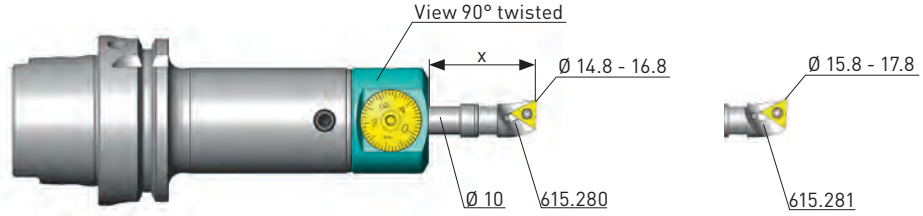


EWN 04-22, universal

	Workpiece material	Boring depth	universal Ø 14.8 - 18.8 / 19.8mm							optimized Ø 14.8 - 16.8 / 17.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	25	655.318	0.4	150	0.2	0.6	0.10	0.18	655.385	0.4	180	0.2	0.6	0.10	0.18
		35	655.318	0.4	120	0.2	0.6	0.10	0.16	655.385	0.4	150	0.2	0.6	0.10	0.16
		40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.375	0.2	100	0.2	0.6	0.06	0.10
		45	655.319	0.2	60	0.2	0.6	0.06	0.10	655.375	0.2	60	0.2	0.6	0.06	0.10
P	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	25	655.318	0.4	150	0.2	0.6	0.10	0.18	655.385	0.4	180	0.2	0.6	0.10	0.18
		35	655.318	0.4	120	0.2	0.6	0.10	0.16	655.385	0.4	150	0.2	0.6	0.10	0.16
		40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.375	0.2	100	0.2	0.6	0.06	0.10
		45	655.319	0.2	60	0.2	0.6	0.06	0.10	655.375	0.2	60	0.2	0.6	0.06	0.10
P	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	25	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
		35	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
		40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		45	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	25	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
		35	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
		40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		45	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
M	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	25	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	160	0.2	0.6	0.10	0.16
		35	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	130	0.2	0.6	0.10	0.14
		40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		45	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	25	655.380	0.4	150	0.2	0.6	0.10	0.18	655.380	0.4	180	0.2	0.6	0.10	0.18
		35	655.380	0.4	120	0.2	0.6	0.10	0.16	655.380	0.4	150	0.2	0.6	0.10	0.16
		40	655.370	0.2	90	0.2	0.6	0.06	0.10	655.370	0.2	100	0.2	0.6	0.06	0.10
		45	655.370	0.2	60	0.2	0.6	0.06	0.10	655.370	0.2	60	0.2	0.6	0.06	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring head EWN 04-22. The tool holder is made out of steel. The max boring depth is limited to 45 mm. The insert holder 615.280 and 615.281 can be screwed on the same tool holder.

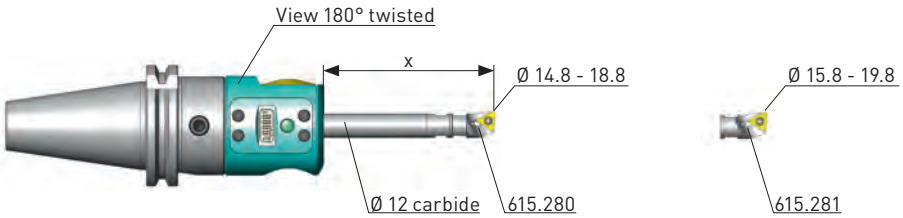


EWN 04-22, optimized

	Workpiece material	Boring depth	universal Ø 14.8 - 18.8 / 19.8 mm							optimized Ø 14.8 - 16.8 / 17.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	25	655.380	0.4	150	0.2	0.6	0.10	0.18	655.380	0.4	180	0.2	0.6	0.10	0.18
	< 500 N/mm2	35	655.380	0.4	120	0.2	0.6	0.10	0.16	655.380	0.4	150	0.2	0.6	0.10	0.16
	GGG 40	40	655.370	0.2	90	0.2	0.6	0.06	0.10	655.370	0.2	100	0.2	0.6	0.06	0.10
	GGG 50	45	655.370	0.2	60	0.2	0.6	0.06	0.10	655.370	0.2	60	0.2	0.6	0.06	0.10
	GGG	25	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
	< 800 N/mm2	35	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
	GGG 60	40	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
	GGG 70	45	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
	GGG 80															
N	Aluminium	25	655.388	0.4	150	0.2	0.6	0.10	0.20	655.388	0.4	200	0.2	0.6	0.10	0.20
	Wrought alloys	35	655.388	0.4	120	0.2	0.6	0.10	0.18	655.388	0.4	170	0.2	0.6	0.10	0.18
	Si < 10%	40	655.388	0.4	90	0.2	0.6	0.10	0.14	655.388	0.4	120	0.2	0.6	0.10	0.14
	3.1354	45	655.378	0.2	60	0.2	0.6	0.06	0.10	655.378	0.2	70	0.2	0.6	0.06	0.10
	3.2315															
	3.3545															
	3.4365															
	Aluminium	25	655.318	0.4	150	0.2	0.6	0.10	0.20	655.318	0.4	200	0.2	0.6	0.10	0.20
	Cast alloys	35	655.318	0.4	120	0.2	0.6	0.10	0.18	655.318	0.4	170	0.2	0.6	0.10	0.18
	Si > 10%	40	655.318	0.4	90	0.2	0.6	0.10	0.14	655.318	0.4	120	0.2	0.6	0.10	0.14
	G-AlSi 12	45	655.319	0.2	60	0.2	0.6	0.06	0.10	655.319	0.2	70	0.2	0.6	0.06	0.10
	G-AlSi17Cu4Mg															
S		25	655.318	0.4	100	0.2	0.6	0.10	0.18	655.318	0.4	100	0.2	0.6	0.10	0.18
	Titanium	35	655.318	0.4	80	0.2	0.6	0.10	0.16	655.318	0.4	80	0.2	0.6	0.10	0.16
	3.7164	40	655.319	0.2	70	0.2	0.6	0.06	0.10	655.319	0.2	70	0.2	0.6	0.06	0.10
		45	655.319	0.2	50	0.2	0.6	0.06	0.10	655.319	0.2	50	0.2	0.6	0.06	0.10
		25	655.326	0.4	30	0.2	0.6	0.10	0.16	655.326	0.4	30	0.2	0.6	0.10	0.16
	Ni-basic-,	35	655.326	0.4	30	0.2	0.6	0.10	0.14	655.326	0.4	30	0.2	0.6	0.10	0.14
	Co-basic-,	40	655.316	0.2	25	0.2	0.6	0.06	0.10	655.316	0.2	25	0.2	0.6	0.06	0.10
	Alloys	45	655.316	0.2	20	0.2	0.6	0.06	0.08	655.316	0.2	20	0.2	0.6	0.06	0.08

When applying the optimized cutting data, the following boring diameters may not be exceeded:

- with insert holder 615.280: Ø 16.8 mm
- with insert holder 615.281: Ø 17.8 mm

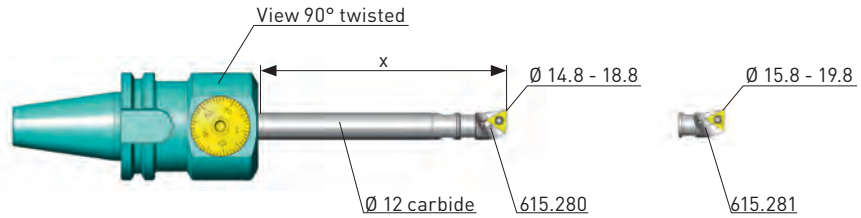


EWE 2-32, universal

	Workpiece material	Boring depth	universal Ø 14.8 - 18.8 / 19.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	35	655.318	0.4	170	0.2	0.8	0.10	0.18
		45	655.318	0.4	150	0.2	0.8	0.10	0.18
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	35	655.318	0.4	170	0.2	0.8	0.10	0.18
		45	655.318	0.4	150	0.2	0.8	0.10	0.18
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	35	655.318	0.4	170	0.2	0.8	0.10	0.16
		45	655.318	0.4	150	0.2	0.8	0.10	0.16
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	35	655.318	0.4	170	0.2	0.8	0.10	0.16
		45	655.318	0.4	150	0.2	0.8	0.10	0.16
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	35	655.318	0.4	170	0.2	0.8	0.10	0.16
		45	655.318	0.4	150	0.2	0.8	0.10	0.16
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	35	655.380	0.4	170	0.2	0.8	0.10	0.18
		45	655.380	0.4	150	0.2	0.8	0.10	0.18
		60	655.380	0.4	125	0.2	0.6	0.10	0.14
		75	655.370	0.2	100	0.2	0.6	0.06	0.10
		90	655.370	0.2	80	0.2	0.6	0.06	0.10
		105	655.363	0.1	60	0.2	0.4	0.04	0.08
		120	655.363	0.1	30	0.2	0.4	0.04	0.08

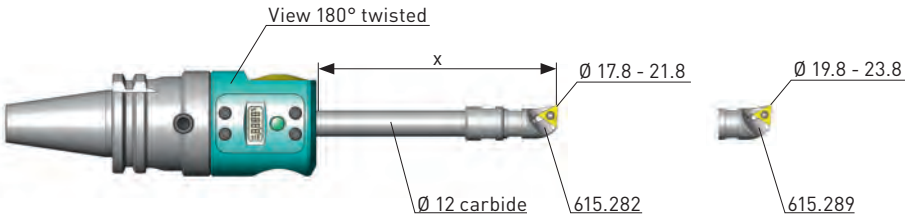
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories.



EWN 2-32, universal

	Workpiece material	Boring depth	universal Ø 14.8 - 18.8 / 19.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	35	655.380	0.4	170	0.2	0.8	0.10	0.18
		45	655.380	0.4	150	0.2	0.8	0.10	0.18
		60	655.380	0.4	125	0.2	0.6	0.10	0.14
		75	655.370	0.2	100	0.2	0.6	0.06	0.10
		90	655.370	0.2	80	0.2	0.6	0.06	0.10
		105	655.363	0.1	60	0.2	0.4	0.04	0.08
		120	655.363	0.1	30	0.2	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	35	655.318	0.4	170	0.2	0.8	0.10	0.16
		45	655.318	0.4	150	0.2	0.8	0.10	0.16
		60	655.318	0.4	125	0.2	0.6	0.10	0.14
		75	655.319	0.2	100	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.6	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	35	655.388	0.4	200	0.2	0.8	0.10	0.20
		45	655.388	0.4	200	0.2	0.8	0.10	0.20
		60	655.388	0.4	180	0.2	0.8	0.10	0.16
		75	655.378	0.2	150	0.2	0.6	0.06	0.14
		90	655.378	0.2	110	0.2	0.6	0.06	0.12
		105	655.363	0.1	80	0.2	0.4	0.04	0.10
		120	655.363	0.1	40	0.2	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	35	655.318	0.4	200	0.2	0.8	0.10	0.20
		45	655.318	0.4	200	0.2	0.8	0.10	0.20
		60	655.318	0.4	180	0.2	0.8	0.10	0.16
		75	655.319	0.2	150	0.2	0.6	0.06	0.14
		90	655.319	0.2	110	0.2	0.6	0.06	0.12
		105	655.369	0.1	80	0.2	0.4	0.04	0.10
		120	655.369	0.1	40	0.2	0.4	0.04	0.10
S	Titanium 3.7164	35	655.318	0.4	120	0.2	0.8	0.10	0.18
		45	655.318	0.4	120	0.2	0.8	0.10	0.18
		60	655.318	0.4	100	0.2	0.6	0.10	0.14
		75	655.319	0.2	90	0.2	0.6	0.06	0.10
		90	655.319	0.2	80	0.2	0.4	0.06	0.10
		105	655.369	0.1	60	0.2	0.4	0.04	0.08
		120	655.369	0.1	30	0.2	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	35	655.326	0.4	50	0.2	0.8	0.10	0.14
		45	655.326	0.4	50	0.2	0.8	0.10	0.14
		60	655.316	0.2	50	0.2	0.6	0.06	0.12
		75	655.316	0.2	30	0.2	0.6	0.06	0.12
		90	655.369	0.1	20	0.2	0.4	0.04	0.08

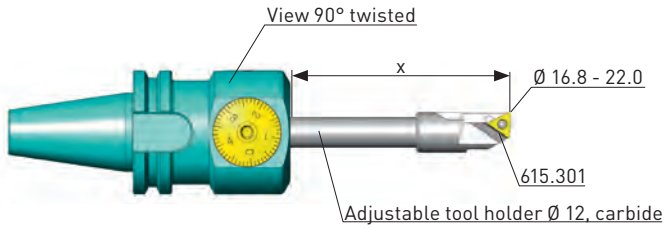


EWE 2-32, universal

	Workpiece material	Boring depth	universal Ø 17.8 - 21.8 / 23.8 mm							optimized Ø 16.8 - 22.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	220	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	200	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	180	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	150	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
		50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
		65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.8	0.10	0.14
		80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.6	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories. The insert holder 615.282 and 615.289 can be screwed on the same tool holder.



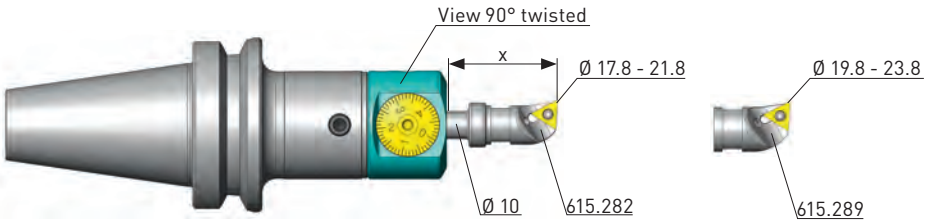
EWN 2-32, optimized

	Workpiece material	Boring depth	universal Ø 17.8 - 21.8 / 23.8 mm							optimized Ø 16.8 - 22.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
		50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
		65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.6	0.10	0.14
		80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.4	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
		50	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
		65	655.388	0.4	180	0.2	0.8	0.10	0.16	655.388	0.4	300	0.2	0.8	0.10	0.16
		80	655.378	0.2	150	0.2	0.6	0.06	0.14	655.388	0.4	260	0.2	0.8	0.10	0.14
		95	655.378	0.2	110	0.2	0.6	0.06	0.12	655.378	0.2	190	0.2	0.6	0.06	0.12
		110	655.363	0.1	80	0.2	0.4	0.04	0.10	655.363	0.1	110	0.2	0.6	0.04	0.10
		125	655.363	0.1	40	0.2	0.4	0.04	0.10							
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
		50	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
		65	655.318	0.4	180	0.2	0.8	0.10	0.16	655.318	0.4	300	0.2	0.8	0.10	0.16
		80	655.319	0.2	150	0.2	0.6	0.06	0.14	655.318	0.4	260	0.2	0.8	0.10	0.14
		95	655.319	0.2	110	0.2	0.6	0.06	0.12	655.319	0.2	190	0.2	0.6	0.06	0.12
		110	655.369	0.1	80	0.2	0.4	0.04	0.10	655.369	0.1	110	0.2	0.6	0.04	0.10
		125	655.369	0.1	40	0.2	0.4	0.04	0.10							
S	Titanium 3.7164	40	655.318	0.4	120	0.2	0.8	0.10	0.18	655.320	0.8	120	0.2	0.8	0.14	0.18
		50	655.318	0.4	120	0.2	0.8	0.10	0.18	655.318	0.4	120	0.2	0.8	0.10	0.18
		65	655.318	0.4	100	0.2	0.6	0.10	0.14	655.318	0.4	120	0.2	0.6	0.10	0.14
		80	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.4	0.06	0.10	655.319	0.2	80	0.2	0.4	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	60	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
		50	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
		65	655.316	0.2	50	0.2	0.6	0.06	0.12	655.316	0.2	50	0.2	0.6	0.06	0.12
		80	655.316	0.2	30	0.2	0.6	0.06	0.12	655.316	0.2	30	0.2	0.6	0.06	0.12
		95	655.369	0.1	20	0.2	0.4	0.04	0.08	655.369	0.1	25	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 22.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

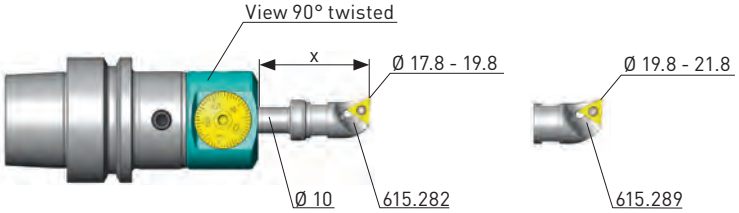


EWN 04-22, universal

	Workpiece material	Boring depth	universal Ø 17.8 - 21.8 / 23.8 mm							optimized Ø 17.8 - 19.8 / 21.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	30	655.318	0.4	150	0.2	0.6	0.10	0.18	655.385	0.4	180	0.2	0.6	0.10	0.18
		40	655.318	0.4	120	0.2	0.6	0.10	0.16	655.385	0.4	150	0.2	0.6	0.10	0.16
		45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.375	0.2	100	0.2	0.6	0.06	0.10
		50	655.319	0.2	60	0.2	0.6	0.06	0.10	655.375	0.2	60	0.2	0.6	0.06	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	30	655.318	0.4	150	0.2	0.6	0.10	0.18	655.385	0.4	180	0.2	0.6	0.10	0.18
		40	655.318	0.4	120	0.2	0.6	0.10	0.16	655.385	0.4	150	0.2	0.6	0.10	0.16
		45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.375	0.2	100	0.2	0.6	0.06	0.10
		50	655.319	0.2	60	0.2	0.6	0.06	0.10	655.375	0.2	60	0.2	0.6	0.06	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	30	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
		40	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
		45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		50	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	30	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
		40	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
		45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		50	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	30	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	160	0.2	0.6	0.10	0.16
		40	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	130	0.2	0.6	0.10	0.14
		45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		50	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	30	655.380	0.4	150	0.2	0.6	0.10	0.18	655.380	0.4	180	0.2	0.6	0.10	0.18
		40	655.380	0.4	120	0.2	0.6	0.10	0.16	655.380	0.4	150	0.2	0.6	0.10	0.16
		45	655.370	0.2	90	0.2	0.6	0.06	0.10	655.370	0.2	100	0.2	0.6	0.06	0.10
		50	655.370	0.2	60	0.2	0.6	0.06	0.10	655.370	0.2	60	0.2	0.6	0.06	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring head EWN 04-22. The tool holder is made out of steel. The max boring depth is limited to 50 mm. The insert holder 615.282 and 615.289 can be screwed on the same tool holder.

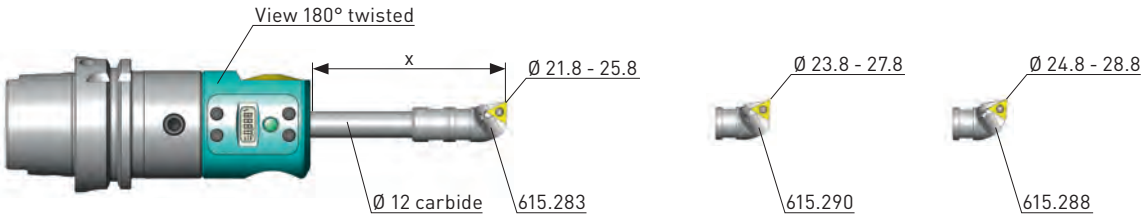


EWN 04-22, optimized

	Workpiece material	Boring depth	universal Ø 17.8 - 21.8 / 23.8 mm							optimized Ø 17.8 - 19.8 / 21.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	30	655.380	0.4	150	0.2	0.6	0.10	0.18	655.380	0.4	180	0.2	0.6	0.10	0.18
	< 500 N/mm2	40	655.380	0.4	120	0.2	0.6	0.10	0.16	655.380	0.4	150	0.2	0.6	0.10	0.16
	GGG 40	45	655.370	0.2	90	0.2	0.6	0.06	0.10	655.370	0.2	100	0.2	0.6	0.06	0.10
	GGG 50	50	655.370	0.2	60	0.2	0.6	0.06	0.10	655.370	0.2	60	0.2	0.6	0.06	0.10
	GGG	30	655.318	0.4	150	0.2	0.6	0.10	0.16	655.318	0.4	170	0.2	0.6	0.10	0.16
	< 800 N/mm2	40	655.318	0.4	120	0.2	0.6	0.10	0.14	655.318	0.4	140	0.2	0.6	0.10	0.14
	GGG 60	45	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
	GGG 70	50	655.319	0.2	60	0.2	0.6	0.06	0.08	655.319	0.2	60	0.2	0.6	0.06	0.08
	GGG 80															
N	Aluminium	30	655.388	0.4	150	0.2	0.6	0.10	0.20	655.388	0.4	200	0.2	0.6	0.10	0.20
	Wrought alloys	40	655.388	0.4	120	0.2	0.6	0.10	0.18	655.388	0.4	170	0.2	0.6	0.10	0.18
	Si < 10%	45	655.388	0.4	90	0.2	0.6	0.10	0.14	655.388	0.4	120	0.2	0.6	0.10	0.14
	3.1354	50	655.378	0.2	60	0.2	0.6	0.06	0.10	655.378	0.2	70	0.2	0.6	0.06	0.10
	3.2315															
	3.3545															
	3.4365															
	Aluminium	30	655.318	0.4	150	0.2	0.6	0.10	0.20	655.318	0.4	200	0.2	0.6	0.10	0.20
	Cast alloys	40	655.318	0.4	120	0.2	0.6	0.10	0.18	655.318	0.4	170	0.2	0.6	0.10	0.18
	Si > 10%	45	655.318	0.4	90	0.2	0.6	0.10	0.14	655.318	0.4	120	0.2	0.6	0.10	0.14
	G-AlSi 12	50	655.319	0.2	60	0.2	0.6	0.06	0.10	655.319	0.2	70	0.2	0.6	0.06	0.10
	G-AlSi17Cu4Mg															
S	Titanium	30	655.318	0.4	100	0.2	0.6	0.10	0.18	655.318	0.4	100	0.2	0.6	0.10	0.18
	3.7164	40	655.318	0.4	80	0.2	0.6	0.10	0.16	655.318	0.4	80	0.2	0.6	0.10	0.16
		45	655.319	0.2	70	0.2	0.6	0.06	0.10	655.319	0.2	70	0.2	0.6	0.06	0.10
		50	655.319	0.2	50	0.2	0.6	0.06	0.10	655.319	0.2	50	0.2	0.6	0.06	0.10
	Ni-basic-,	30	655.326	0.4	30	0.2	0.6	0.10	0.16	655.326	0.4	30	0.2	0.6	0.10	0.16
	Co-basic-,	40	655.326	0.4	30	0.2	0.6	0.10	0.14	655.326	0.4	30	0.2	0.6	0.10	0.14
	Alloys	45	655.316	0.2	25	0.2	0.6	0.06	0.10	655.316	0.2	25	0.2	0.6	0.06	0.10
		50	655.316	0.2	20	0.2	0.6	0.06	0.08	655.316	0.2	20	0.2	0.6	0.06	0.08

When applying the optimized cutting data, the following boring diameters may not be exceeded:

- with insert holder 615.282: Ø 19.8 mm
- with insert holder 615.289: Ø 21.8 mm

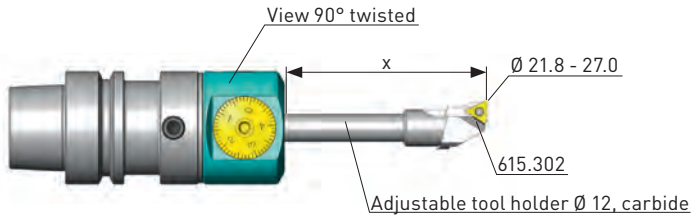


EWE 2-32, universal

	Workpiece material	Boring depth	universal Ø 21.8 - 25.8 / 27.8 / 28.8 mm							optimized Ø 21.8 - 27.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	220	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	200	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	180	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	150	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
		50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
		65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.8	0.10	0.14
		80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.6	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories. The insert holder 615.283, 615.290 and 615.288 can be screwed on the same tool holder.



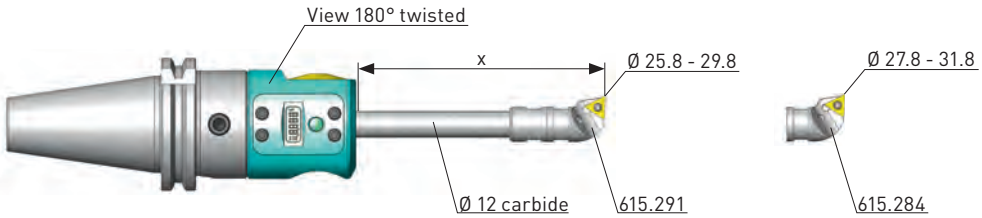
EWN 2-32, optimized

	Workpiece material	Boring depth	universal Ø 21.8 - 25.8 / 27.8 / 28.8 mm							optimized Ø 21.8 - 27.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
		50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
		65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.6	0.10	0.14
		80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.4	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
		50	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
		65	655.388	0.4	180	0.2	0.8	0.10	0.16	655.388	0.4	300	0.2	0.8	0.10	0.16
		80	655.378	0.2	150	0.2	0.6	0.06	0.14	655.388	0.4	260	0.2	0.8	0.10	0.14
		95	655.378	0.2	110	0.2	0.6	0.06	0.12	655.378	0.2	190	0.2	0.6	0.06	0.12
		110	655.363	0.1	80	0.2	0.4	0.04	0.10	655.363	0.1	110	0.2	0.6	0.04	0.10
		125	655.363	0.1	40	0.2	0.4	0.04	0.10							
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
		50	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
		65	655.318	0.4	180	0.2	0.8	0.10	0.16	655.318	0.4	300	0.2	0.8	0.10	0.16
		80	655.319	0.2	150	0.2	0.6	0.06	0.14	655.318	0.4	260	0.2	0.8	0.10	0.14
		95	655.319	0.2	110	0.2	0.6	0.06	0.12	655.319	0.2	190	0.2	0.6	0.06	0.12
		110	655.369	0.1	80	0.2	0.4	0.04	0.10	655.369	0.1	110	0.2	0.6	0.04	0.10
		125	655.369	0.1	40	0.2	0.4	0.04	0.10							
S	Titanium 3.7164	40	655.318	0.4	120	0.2	0.8	0.10	0.18	655.320	0.8	120	0.2	0.8	0.14	0.18
		50	655.318	0.4	120	0.2	0.8	0.10	0.18	655.318	0.4	120	0.2	0.8	0.10	0.18
		65	655.318	0.4	100	0.2	0.6	0.10	0.14	655.318	0.4	120	0.2	0.6	0.10	0.14
		80	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.4	0.06	0.10	655.319	0.2	80	0.2	0.4	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	60	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
		50	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
		65	655.316	0.2	50	0.2	0.6	0.06	0.12	655.316	0.2	50	0.2	0.6	0.06	0.12
		80	655.316	0.2	30	0.2	0.6	0.06	0.12	655.316	0.2	30	0.2	0.6	0.06	0.12
		95	655.369	0.1	20	0.2	0.4	0.04	0.08	655.369	0.1	25	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 27.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended

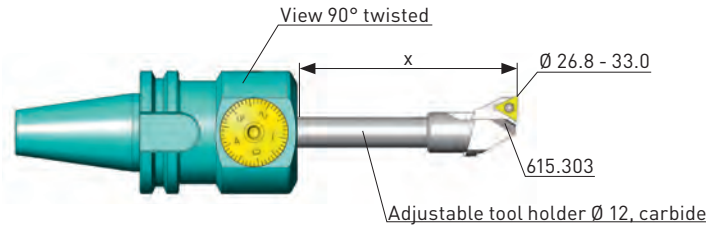


EWE 2-32, universal

	Workpiece material	Boring depth	universal Ø 25.8 - 29.8 / 31.8 mm							optimized Ø 26.8 - 33.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	170	0.2	0.8	0.10	0.18	655.395	0.8	260	0.2	0.8	0.14	0.18
		50	655.318	0.4	150	0.2	0.8	0.10	0.18	655.385	0.4	240	0.2	0.8	0.10	0.18
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.385	0.4	200	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.375	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	220	0.2	0.8	0.14	0.16
		50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	200	0.2	0.8	0.10	0.16
		65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	180	0.2	0.8	0.10	0.14
		80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	150	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
		50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
		65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.8	0.10	0.14
		80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.6	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The cutting data are valid for the fine boring heads EWN/EWE 2-32 and the corresponding accessories. The insert holder 615.291 and 615.284 can be screwed on the same tool holder.



EWN 2-32, optimized

	Workpiece material	Boring depth	universal Ø 25.8 - 29.8 / 31.8 mm							optimized Ø 26.8 - 33.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	40	655.380	0.4	170	0.2	0.8	0.10	0.18	655.390	0.8	260	0.2	0.8	0.14	0.18
	< 500 N/mm2	50	655.380	0.4	150	0.2	0.8	0.10	0.18	655.380	0.4	240	0.2	0.8	0.10	0.18
	GGG 40	65	655.380	0.4	125	0.2	0.6	0.10	0.14	655.380	0.4	200	0.2	0.6	0.10	0.14
	GGG 50	80	655.370	0.2	100	0.2	0.6	0.06	0.10	655.370	0.2	160	0.2	0.6	0.06	0.10
		95	655.370	0.2	80	0.2	0.6	0.06	0.10	655.370	0.2	120	0.2	0.4	0.06	0.10
		110	655.363	0.1	60	0.2	0.4	0.04	0.08	655.363	0.1	70	0.2	0.4	0.04	0.08
		125	655.363	0.1	30	0.2	0.4	0.04	0.08							
	GGG	40	655.318	0.4	170	0.2	0.8	0.10	0.16	655.320	0.8	240	0.2	0.8	0.14	0.16
	< 800 N/mm2	50	655.318	0.4	150	0.2	0.8	0.10	0.16	655.318	0.4	220	0.2	0.8	0.10	0.16
	GGG 60	65	655.318	0.4	125	0.2	0.6	0.10	0.14	655.318	0.4	190	0.2	0.8	0.10	0.14
	GGG 70	80	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	160	0.2	0.6	0.06	0.10
	GGG 80	95	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	70	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
N	Aluminium	40	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
	Wrought alloys	50	655.388	0.4	200	0.2	0.8	0.10	0.20	655.398	0.8	420	0.2	0.8	0.14	0.20
	Si < 10%	65	655.388	0.4	180	0.2	0.8	0.10	0.16	655.388	0.4	300	0.2	0.8	0.10	0.16
	3.1354	80	655.378	0.2	150	0.2	0.6	0.06	0.14	655.388	0.4	260	0.2	0.8	0.10	0.14
	3.2315	95	655.378	0.2	110	0.2	0.6	0.06	0.12	655.378	0.2	190	0.2	0.6	0.06	0.12
	3.3545	110	655.363	0.1	80	0.2	0.4	0.04	0.10	655.363	0.1	110	0.2	0.6	0.04	0.10
	3.4365	125	655.363	0.1	40	0.2	0.4	0.04	0.10							
	Aluminium	40	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
	Cast alloys	50	655.318	0.4	200	0.2	0.8	0.10	0.20	655.320	0.8	420	0.2	0.8	0.14	0.20
	Si > 10%	65	655.318	0.4	180	0.2	0.8	0.10	0.16	655.318	0.4	300	0.2	0.8	0.10	0.16
	G-AlSi 12	80	655.319	0.2	150	0.2	0.6	0.06	0.14	655.318	0.4	260	0.2	0.8	0.10	0.14
	G-AlSi17Cu4Mg	95	655.319	0.2	110	0.2	0.6	0.06	0.12	655.319	0.2	190	0.2	0.6	0.06	0.12
		110	655.369	0.1	80	0.2	0.4	0.04	0.10	655.369	0.1	110	0.2	0.6	0.04	0.10
		125	655.369	0.1	40	0.2	0.4	0.04	0.10							
S		40	655.318	0.4	120	0.2	0.8	0.10	0.18	655.320	0.8	120	0.2	0.8	0.14	0.18
	Titanium	50	655.318	0.4	120	0.2	0.8	0.10	0.18	655.318	0.4	120	0.2	0.8	0.10	0.18
	3.7164	65	655.318	0.4	100	0.2	0.6	0.10	0.14	655.318	0.4	120	0.2	0.6	0.10	0.14
		80	655.319	0.2	90	0.2	0.6	0.06	0.10	655.319	0.2	100	0.2	0.6	0.06	0.10
		95	655.319	0.2	80	0.2	0.4	0.06	0.10	655.319	0.2	80	0.2	0.4	0.06	0.10
		110	655.369	0.1	60	0.2	0.4	0.04	0.08	655.369	0.1	60	0.2	0.4	0.04	0.08
		125	655.369	0.1	30	0.2	0.4	0.04	0.08							
		40	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
	Ni-basic-,	50	655.326	0.4	50	0.2	0.8	0.10	0.14	655.326	0.4	50	0.2	0.8	0.10	0.14
	Co-basic-,	65	655.316	0.2	50	0.2	0.6	0.06	0.12	655.316	0.2	50	0.2	0.6	0.06	0.12
	Alloys	80	655.316	0.2	30	0.2	0.6	0.06	0.12	655.316	0.2	30	0.2	0.6	0.06	0.12
		95	655.369	0.1	20	0.2	0.4	0.04	0.08	655.369	0.1	25	0.2	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 33.0 mm may not be exceeded
- the use of a fine balanced tool shank or of the EWN 2-32 integral is recommended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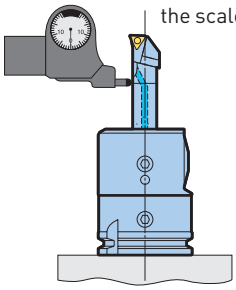
The cutting data are valid for the fine boring heads EWN 2-152 and EWE 2-152 and are applicable when tool holders and boring cutters made of carbide are used. The different diameter ranges are in line with the existing accessories. On a double page, there are cutting data for one specific diameter range. The columns **"universal"** and **"optimized"** differ in terms of cutting data and inserts. The cutting data in **the column „optimized"** are applicable when the best possible accessories for each diameter range are used. This includes the use of adjustable tool holders for diameter 9.8 mm and bigger. The optimized accessories are clamped in the centre, or close to the centre position. Therefore the imbalance is minimized which permits higher cutting speeds. The listed inserts reflect the best possible choice under consideration of workpiece material and boring depth.

In **the column "universal"**, the cutting data are lower and the choice of inserts is reduced. The lower data permit a bigger applicable boring range (starting diameter + 5 mm). These data are recommended for single piece production.

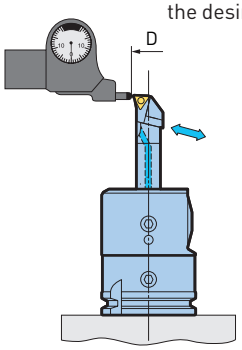
Important: The cutting data must in any case be adapted to the working conditions.

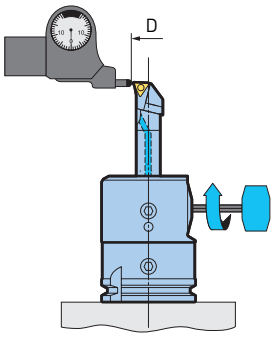
Application advices for adjustable tool holders (EWN 2-152/EWE 2-152, boring range Ø 9.8 – 54 mm, optimized)

Set adjustable tool holder to the centre position by means of the scale screw



Set the insert holder to the desired diameter





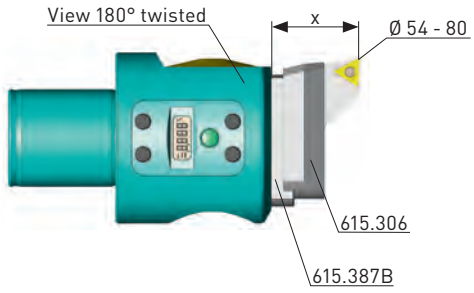
Measuring cut: Reduce diameter setting by 0.1 mm by means of the scale screw

- Adjust insert holder to the measuring cut diameter
- Perform measuring cut, measure bore diameter
- Adjust difference by means of scale screw

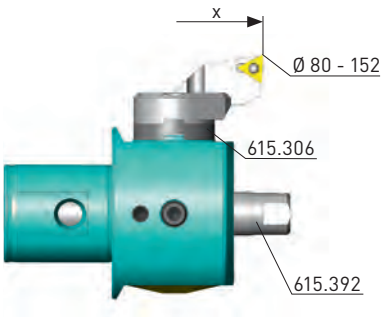
Extended boring range

With special accessories, the boring range of the EWN/EWE 2-152 to Ø 152 mm can be extended.
The cutting data are listed on page 134-137.

EWN 2-152/EWE 2-152



EWN 2-152/EWE 2-152

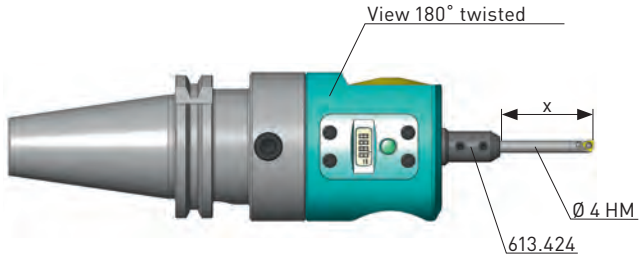


In the table the following terms and dimensions are used:

Workpiece material:	Material no. according to DIN or generally used designation	
Boring depth X:	Projection of the tool holder	(mm)
Insert:	Detailed information about the inserts is shown in the BIG KAISER main catalogue.	
R:	Nose radius of boring cutter/insert	(mm)
Vc:	Cutting speed	(m/min)
Stock allow.:	Sock allowance per cut in Ø	(mm)
fn:	Feed per revolution	(mm/U)
Ra:	Surface quality (Ra 1.6 µm for N7)	

Balanceable fine boring head EWB 2-50

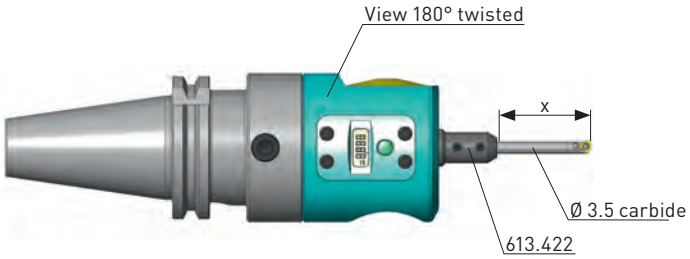
There are special cutting data and adjustment tables for the balanceable fine boring head EWB 2-50. These data tables are delivered with the tool.



Workpiece material		Ø 2.0-3.0 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	9	611.155	0.2	60	0.1	0.008
M	Stainless steels	9	611.155	0.2	60	0.1	0.008
K	Cast iron	9	611.155	0.2	60	0.1	0.008
N	Aluminium	9	611.155	0.2	60	0.1	0.008
	Non-ferrous metals	9	611.155	0.2	60	0.1	0.008
S	Titaniumium	9	611.155	0.2	40	0.1	0.008

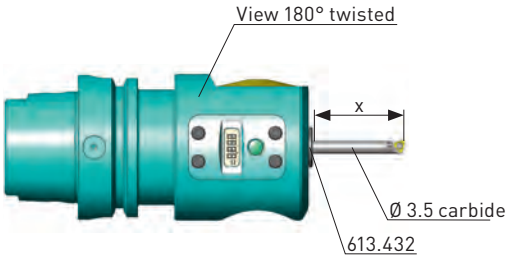
Workpiece material		Ø 3.0-3.9 mm					
		Boring depth	Carbide boring bars		Vc (max)*	Allow.	Feed
		X [mm]	Order No.	R	m/min	mm/Ø	mm/U
P	Steel	14	611.156	0.2	90	0.1	0.008
M	Stainless steels	14	611.156	0.2	90	0.1	0.008
K	Cast iron	14	611.156	0.2	90	0.1	0.008
N	Aluminium	14	611.156	0.2	90	0.1	0.008
	Non-ferrous metals	14	611.156	0.2	90	0.1	0.008
S	Titaniumium	14	611.156	0.2	50	0.1	0.008

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 3.9 - 5.8 mm							optimized Ø 3.9 - 4.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	615.203A	0.1	80	0.1	0.3	0.04	0.08	615.203A	0.1	90	0.1	0.3	0.04	0.08
		15	615.203A	0.1	65	0.1	0.3	0.04	0.08	615.203A	0.1	70	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	615.203A	0.1	80	0.1	0.3	0.04	0.08	615.203A	0.1	90	0.1	0.3	0.04	0.08
		15	615.203A	0.1	65	0.1	0.3	0.04	0.08	615.203A	0.1	70	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		15	615.203A	0.1	60	0.1	0.3	0.04	0.08	615.203A	0.1	65	0.1	0.3	0.04	0.08
		20	615.203A	0.1	45	0.1	0.2	0.04	0.06	615.203A	0.1	50	0.1	0.2	0.04	0.06
		25	615.203A	0.1	30	0.1	0.2	0.04	0.06	615.203A	0.1	35	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	25	0.1	0.2	0.04	0.06
K	Gray cast iron GG 15 GG 20 GG 25 GG 30	10	615.203A	0.1	90	0.1	0.3	0.04	0.08	615.203A	0.1	100	0.1	0.3	0.04	0.08
		15	615.203A	0.1	70	0.1	0.3	0.04	0.08	615.203A	0.1	80	0.1	0.3	0.04	0.08
		20	615.203A	0.1	50	0.1	0.2	0.04	0.06	615.203A	0.1	55	0.1	0.2	0.04	0.06
		25	615.203A	0.1	35	0.1	0.2	0.04	0.06	615.203A	0.1	40	0.1	0.2	0.04	0.06
		30	615.203A	0.1	25	0.1	0.2	0.04	0.06	615.203A	0.1	30	0.1	0.2	0.04	0.06

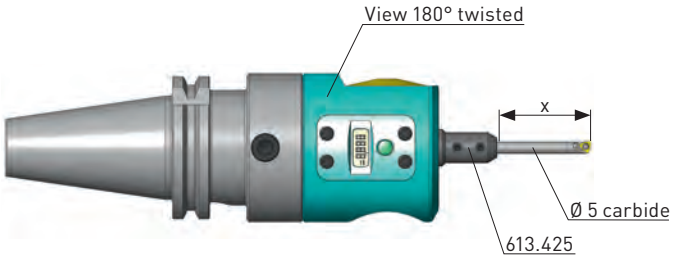
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 3.9 - 5.8 mm							optimized Ø 3.9 - 4.9 mm						
			Boring cutter		Vc	Allow. mm/Ø		Feed mm/U		Boring cutter		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	10	615.203A	0.1	90	0.10	0.3	0.04	0.08	615.203A	0.1	100	0.10	0.3	0.04	0.08
	< 500 N/mm2	15	615.203A	0.1	70	0.10	0.3	0.04	0.08	615.203A	0.1	80	0.10	0.3	0.04	0.08
	GGG 40	20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	55	0.10	0.2	0.04	0.06
	GGG 50	25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	40	0.10	0.2	0.04	0.06
		30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	30	0.10	0.2	0.04	0.06
	GGG	10	615.203A	0.1	80	0.10	0.3	0.04	0.08	615.203A	0.1	90	0.10	0.3	0.04	0.08
	< 800 N/mm2	15	615.203A	0.1	65	0.10	0.3	0.04	0.08	615.203A	0.1	70	0.10	0.3	0.04	0.08
	GGG 60	20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	50	0.10	0.2	0.04	0.06
	GGG 70	25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
	GGG 80	30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
N	Aluminium	10	615.203	0.1	100	0.10	0.3	0.04	0.08	615.203	0.1	120	0.10	0.3	0.04	0.08
	Wrought alloys	15	615.203	0.1	85	0.10	0.3	0.04	0.08	615.203	0.1	100	0.10	0.3	0.04	0.08
	Si < 10%	20	615.203	0.1	60	0.10	0.2	0.04	0.06	615.203	0.1	75	0.10	0.2	0.04	0.06
	3.1354	25	615.203	0.1	40	0.10	0.2	0.04	0.06	615.203	0.1	55	0.10	0.2	0.04	0.06
	3.2315	30	615.203	0.1	30	0.10	0.2	0.04	0.06	615.203	0.1	35	0.10	0.2	0.04	0.06
	3.3545	35	615.203	0.1	20	0.10	0.2	0.04	0.06	615.203	0.1	25	0.10	0.2	0.04	0.06
	3.4365															
	Aluminium	10	615.203A	0.1	100	0.10	0.3	0.04	0.08	615.203A	0.1	120	0.10	0.3	0.04	0.08
	Cast alloys	15	615.203A	0.1	85	0.10	0.3	0.04	0.08	615.203A	0.1	100	0.10	0.3	0.04	0.08
	Si > 10%	20	615.203A	0.1	60	0.10	0.2	0.04	0.06	615.203A	0.1	75	0.10	0.2	0.04	0.06
	G-AlSi 12	25	615.203A	0.1	40	0.10	0.2	0.04	0.06	615.203A	0.1	55	0.10	0.2	0.04	0.06
	G-AlSi17Cu4Mg	30	615.203A	0.1	30	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
		35	615.203A	0.1	20	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
S	Titanium	10	615.203A	0.1	90	0.10	0.3	0.04	0.08	615.203A	0.1	90	0.10	0.3	0.04	0.08
	3.7164	15	615.203A	0.1	70	0.10	0.3	0.04	0.08	615.203A	0.1	70	0.10	0.3	0.04	0.08
		20	615.203A	0.1	50	0.10	0.2	0.04	0.06	615.203A	0.1	50	0.10	0.2	0.04	0.06
		25	615.203A	0.1	35	0.10	0.2	0.04	0.06	615.203A	0.1	35	0.10	0.2	0.04	0.06
		30	615.203A	0.1	25	0.10	0.2	0.04	0.06	615.203A	0.1	25	0.10	0.2	0.04	0.06
	Ni-basic-,	10	615.203A	0.1	40	0.05	0.1	0.04	0.06	615.203A	0.1	40	0.05	0.1	0.04	0.06
	Co-basic-,	15	615.203A	0.1	30	0.05	0.1	0.04	0.06	615.203A	0.1	30	0.05	0.1	0.04	0.06
	Alloys	20	615.203A	0.1	30	0.05	0.1	0.04	0.06	615.203A	0.1	30	0.05	0.1	0.04	0.06

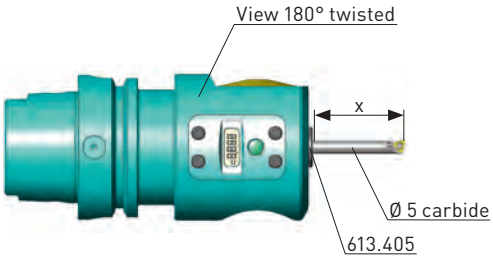
When applying the optimized cutting data:

- the boring diameter of 7.3 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



	Workpiece material	Boring depth	universal Ø 5.8 - 10.8 mm							optimized Ø 5.8 - 7.3 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
P	< 450 N/mm2	20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
P		30	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	90	0.1	0.3	0.06	0.07
P	1.0037	40	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
P	1.0401	50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
P	1.0715	60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
P																
P	Steel	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
P	450-850 N/mm2	20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
P	1.0050	30	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	90	0.1	0.3	0.06	0.07
P	1.0503	40	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
P	1.1141	50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
P	1.1191	60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
P	1.5752															
P	Steel	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
P	850-1200 N/mm2	20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
P	1.2083	30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
P	1.2294	40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
P	1.2312	50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
P	1.2344	60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
P	1.2764															
M	Stainless steels,	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
M	ferritic,	20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
M	martensitic	30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
M	1.4016	40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
M	1.4024	50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
M	1.4034	60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
M	1.4762															
M	Stainless steels,	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	110	0.1	0.3	0.06	0.08
M	austenitic	20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	90	0.1	0.3	0.06	0.08
M	1.4301	30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	70	0.1	0.3	0.06	0.06
M	1.4311	40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
M	1.4401	50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
M	1.4435	60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
M	1.4571															
K	Gray cast iron	10	655.603	0.2	100	0.1	0.4	0.06	0.10	655.603	0.2	150	0.1	0.4	0.06	0.10
K		20	655.603	0.2	80	0.1	0.4	0.06	0.10	655.603	0.2	120	0.1	0.4	0.06	0.10
K	GG15	30	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	90	0.1	0.4	0.06	0.07
K	GG 20	40	655.605	0.1	60	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
K	GG 25	50	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
K	GG 30	60	655.605	0.1	25	0.1	0.2	0.04	0.07	655.605	0.1	30	0.1	0.2	0.04	0.07
K																

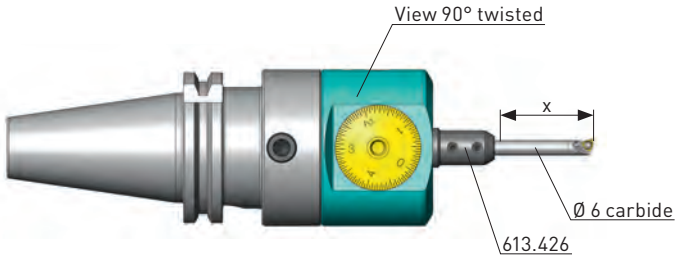
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 5.8 - 10.8 mm							optimized Ø 5.8 - 7.3 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	10	655.603	0.2	100	0.1	0.3	0.06	0.10	655.603	0.2	150	0.1	0.3	0.06	0.10
		20	655.603	0.2	80	0.1	0.3	0.06	0.10	655.603	0.2	120	0.1	0.3	0.06	0.10
		30	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	90	0.1	0.3	0.06	0.07
		40	655.605	0.1	60	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		50	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		60	655.605	0.1	25	0.1	0.2	0.04	0.07	655.605	0.1	30	0.1	0.2	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	10	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		20	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		30	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		40	655.606	0.1	55	0.1	0.2	0.04	0.06	655.606	0.1	60	0.1	0.2	0.04	0.06
		50	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		60	655.606	0.1	25	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	10	655.601	0.2	120	0.1	0.3	0.06	0.12	655.601	0.2	180	0.1	0.3	0.06	0.12
		20	655.601	0.2	120	0.1	0.3	0.06	0.12	655.601	0.2	150	0.1	0.3	0.06	0.12
		30	655.601	0.2	100	0.1	0.3	0.06	0.11	655.601	0.2	120	0.1	0.3	0.06	0.11
		40	655.604	0.1	80	0.1	0.2	0.04	0.08	655.601	0.2	100	0.1	0.3	0.06	0.08
		50	655.604	0.1	60	0.1	0.2	0.04	0.08	655.604	0.1	80	0.1	0.2	0.04	0.08
		60	655.604	0.1	40	0.1	0.2	0.04	0.08	655.604	0.1	50	0.1	0.2	0.04	0.08
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	10	655.602	0.2	120	0.1	0.3	0.06	0.12	655.602	0.2	180	0.1	0.3	0.06	0.12
		20	655.602	0.2	120	0.1	0.3	0.06	0.12	655.602	0.2	150	0.1	0.3	0.06	0.12
		30	655.602	0.2	100	0.1	0.3	0.06	0.11	655.602	0.2	120	0.1	0.3	0.06	0.11
		40	655.606	0.1	80	0.1	0.2	0.04	0.08	655.602	0.2	100	0.1	0.2	0.06	0.08
		50	655.606	0.1	60	0.1	0.2	0.04	0.08	655.606	0.1	80	0.1	0.2	0.04	0.08
		60	655.606	0.1	40	0.1	0.2	0.04	0.08	655.606	0.1	50	0.1	0.2	0.04	0.08
S	Titanium 3.7164	10	655.602	0.2	90	0.1	0.3	0.06	0.10	655.602	0.2	100	0.1	0.3	0.06	0.10
		20	655.602	0.2	70	0.1	0.3	0.06	0.10	655.602	0.2	80	0.1	0.3	0.06	0.10
		30	655.606	0.1	60	0.1	0.2	0.04	0.07	655.602	0.2	70	0.1	0.3	0.06	0.07
		40	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	60	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		60	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	10	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		20	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		30	655.606	0.1	30	0.1	0.2	0.04	0.06	655.602	0.2	30	0.1	0.2	0.06	0.06
		40	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
		50	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06

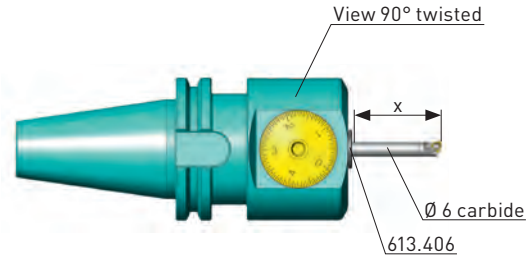
When applying the optimized cutting data:

- the boring diameter of 7.3 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



	Workpiece material	Boring depth	universal Ø 7.3 - 12.3 mm							optimized Ø 7.3 - 7.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	10	655.602	0.2	120	0.1	0.3	0.06	0.10	655.602	0.2	180	0.1	0.3	0.06	0.10
		20	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	140	0.1	0.3	0.06	0.10
		30	655.602	0.2	80	0.1	0.3	0.06	0.09	655.602	0.2	100	0.1	0.3	0.06	0.09
		40	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	80	0.1	0.3	0.06	0.07
		50	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		60	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	35	0.1	0.2	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	10	655.602	0.2	120	0.1	0.3	0.06	0.10	655.602	0.2	180	0.1	0.3	0.06	0.10
		20	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	140	0.1	0.3	0.06	0.10
		30	655.602	0.2	80	0.1	0.3	0.06	0.09	655.602	0.2	100	0.1	0.3	0.06	0.09
		40	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	80	0.1	0.3	0.06	0.07
		50	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		60	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	35	0.1	0.2	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.606	0.1	80	0.1	0.3	0.04	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	110	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	90	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
K	Gray cast iron GG15 GG 20 GG 25 GG 30	10	655.603	0.2	120	0.1	0.4	0.06	0.10	655.603	0.2	180	0.1	0.4	0.06	0.10
		20	655.603	0.2	100	0.1	0.4	0.06	0.10	655.603	0.2	140	0.1	0.4	0.06	0.10
		30	655.603	0.2	80	0.1	0.4	0.06	0.10	655.603	0.2	100	0.1	0.4	0.06	0.10
		40	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	80	0.1	0.4	0.06	0.07
		50	655.605	0.1	50	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		60	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		65	655.605	0.1	30	0.1	0.2	0.04	0.07	655.605	0.1	35	0.1	0.2	0.04	0.07

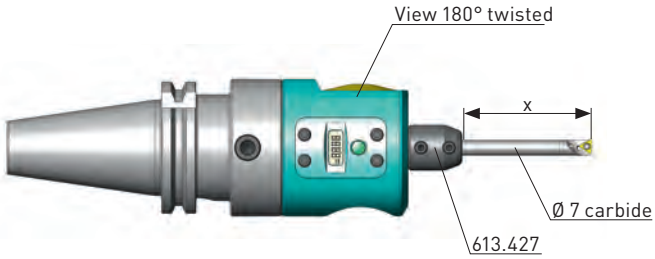
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



Workpiece material		Boring depth	universal Ø 7.3 - 12.3 mm							optimized Ø 7.3 - 7.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	10	655.603	0.2	120	0.1	0.3	0.06	0.10	655.603	0.2	180	0.1	0.3	0.06	0.10
		20	655.603	0.2	100	0.1	0.3	0.06	0.10	655.603	0.2	140	0.1	0.3	0.06	0.10
		30	655.603	0.2	80	0.1	0.3	0.06	0.09	655.603	0.2	100	0.1	0.3	0.06	0.09
		40	655.605	0.1	70	0.1	0.2	0.04	0.07	655.603	0.2	80	0.1	0.3	0.06	0.07
		50	655.605	0.1	50	0.1	0.2	0.04	0.07	655.605	0.1	70	0.1	0.2	0.04	0.07
		60	655.605	0.1	40	0.1	0.2	0.04	0.07	655.605	0.1	50	0.1	0.2	0.04	0.07
		65	655.605	0.1	30	0.1	0.2	0.04	0.07	655.605	0.1	35	0.1	0.2	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	10	655.602	0.2	120	0.1	0.3	0.06	0.08	655.602	0.2	160	0.1	0.3	0.06	0.08
		20	655.602	0.2	100	0.1	0.3	0.06	0.08	655.602	0.2	130	0.1	0.3	0.06	0.08
		30	655.602	0.2	80	0.1	0.3	0.06	0.08	655.602	0.2	100	0.1	0.3	0.06	0.08
		40	655.606	0.1	70	0.1	0.2	0.04	0.06	655.602	0.2	80	0.1	0.3	0.06	0.06
		50	655.606	0.1	50	0.1	0.2	0.04	0.06	655.606	0.1	70	0.1	0.2	0.04	0.06
		60	655.606	0.1	40	0.1	0.2	0.04	0.06	655.606	0.1	50	0.1	0.2	0.04	0.06
		65	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	35	0.1	0.2	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	10	655.601	0.2	140	0.1	0.3	0.06	0.12	655.601	0.2	200	0.1	0.3	0.06	0.12
		20	655.601	0.2	130	0.1	0.3	0.06	0.12	655.601	0.2	180	0.1	0.3	0.06	0.12
		30	655.601	0.2	110	0.1	0.3	0.06	0.10	655.601	0.2	150	0.1	0.3	0.06	0.10
		40	655.601	0.2	90	0.1	0.2	0.06	0.10	655.601	0.2	120	0.1	0.3	0.06	0.10
		50	655.604	0.1	70	0.1	0.2	0.04	0.07	655.601	0.2	100	0.1	0.3	0.06	0.07
		60	655.604	0.1	60	0.1	0.2	0.04	0.07	655.604	0.1	80	0.1	0.2	0.04	0.07
		65	655.604	0.1	50	0.1	0.2	0.04	0.07	655.604	0.1	50	0.1	0.2	0.04	0.07
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	10	655.602	0.2	140	0.1	0.3	0.06	0.12	655.602	0.2	200	0.1	0.3	0.06	0.12
		20	655.602	0.2	130	0.1	0.3	0.06	0.12	655.602	0.2	180	0.1	0.3	0.06	0.12
		30	655.602	0.2	110	0.1	0.3	0.06	0.10	655.602	0.2	150	0.1	0.3	0.06	0.10
		40	655.602	0.2	90	0.1	0.2	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		50	655.606	0.1	70	0.1	0.2	0.04	0.07	655.602	0.2	100	0.1	0.3	0.06	0.07
		60	655.606	0.1	60	0.1	0.2	0.04	0.07	655.606	0.1	80	0.1	0.2	0.04	0.07
		65	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
S	Titanium 3.7164	10	655.602	0.2	100	0.1	0.3	0.06	0.10	655.602	0.2	120	0.1	0.3	0.06	0.10
		20	655.602	0.2	80	0.1	0.3	0.06	0.10	655.602	0.2	100	0.1	0.3	0.06	0.10
		30	655.602	0.2	60	0.1	0.3	0.06	0.09	655.602	0.2	80	0.1	0.3	0.06	0.09
		40	655.606	0.1	50	0.1	0.2	0.04	0.07	655.606	0.1	70	0.1	0.2	0.04	0.07
		50	655.606	0.1	40	0.1	0.2	0.04	0.07	655.606	0.1	60	0.1	0.2	0.04	0.07
		60	655.606	0.1	30	0.1	0.2	0.04	0.07	655.606	0.1	50	0.1	0.2	0.04	0.07
		65	655.606	0.1	25	0.1	0.2	0.04	0.07	655.606	0.1	30	0.1	0.2	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	10	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		20	655.602	0.2	50	0.1	0.2	0.06	0.08	655.602	0.2	50	0.1	0.2	0.06	0.08
		30	655.602	0.2	30	0.1	0.2	0.06	0.06	655.602	0.2	30	0.1	0.2	0.06	0.06
		40	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06
		50	655.606	0.1	30	0.1	0.2	0.04	0.06	655.606	0.1	30	0.1	0.2	0.04	0.06

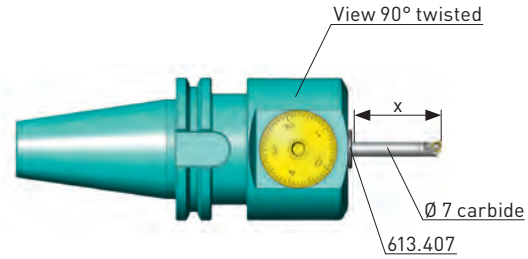
When applying the optimized cutting data:

- the boring diameter of 7.8 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



	Workpiece material	Boring depth	universal Ø 7.8 - 12.8 mm							optimized Ø 7.8 - 8.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.738	0.3	180	0.1	0.5	0.08	0.12
P	< 450 N/mm2	30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.738	0.3	150	0.1	0.5	0.08	0.12
P		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	110	0.1	0.4	0.06	0.10
P	1.0037	50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.1	0.4	0.06	0.10
P	1.0401	60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
P	1.0715	70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
P		85	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
P	Steel	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.738	0.3	180	0.1	0.5	0.08	0.12
P	450-850 N/mm2	30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.738	0.3	150	0.1	0.5	0.08	0.12
P	1.0050	40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	110	0.1	0.4	0.06	0.10
P	1.0503	50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.1	0.4	0.06	0.10
P	1.1141	60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
P	1.1191	70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
P	1.5752	85	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
P	Steel	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
P	850-1200 N/mm2	30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
P	1.2083	40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
P	1.2294	50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
P	1.2312	60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
P	1.2344	70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
P	1.2764	85	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
M	Stainless steels,	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
M	ferritic,	30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
M	martensitic	40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
M	1.4016	50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
M	1.4024	60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
M	1.4034	70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
M	1.4762	85	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
M	Stainless steels,	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
M	austenitic	30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	120	0.1	0.5	0.08	0.10
M	1.4301	40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
M	1.4311	50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
M	1.4401	60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
M	1.4435	70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
M	1.4571	85	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
K	Gray cast iron	20	651.837	0.2	120	0.1	0.6	0.06	0.12	651.735	0.3	180	0.1	0.6	0.08	0.12
K		30	651.837	0.2	100	0.1	0.6	0.06	0.12	651.735	0.3	150	0.1	0.6	0.08	0.12
K	GG15	40	651.837	0.2	90	0.1	0.6	0.06	0.10	651.735	0.3	110	0.1	0.6	0.08	0.10
K	GG 20	50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.1	0.4	0.06	0.10
K	GG 25	60	651.824	0.1	55	0.1	0.4	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
K	GG 30	70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
K		85	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07

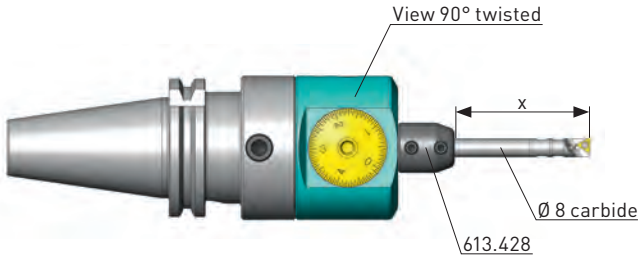
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 7.8 - 12.8 mm							optimized Ø 7.8 - 8.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.837	0.2	120	0.1	0.5	0.06	0.12	651.735	0.3	180	0.1	0.5	0.08	0.12
		30	651.837	0.2	100	0.1	0.5	0.06	0.12	651.735	0.3	150	0.1	0.5	0.08	0.12
		40	651.837	0.2	90	0.1	0.4	0.06	0.10	651.735	0.3	110	0.1	0.5	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.837	0.2	120	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	100	0.1	0.5	0.06	0.10	651.737	0.3	140	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	25	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.825	0.2	150	0.1	0.5	0.06	0.14	651.723	0.3	220	0.1	0.5	0.08	0.14
		30	651.825	0.2	130	0.1	0.5	0.06	0.14	651.723	0.3	200	0.1	0.5	0.08	0.14
		40	651.825	0.2	110	0.1	0.5	0.06	0.12	651.723	0.3	180	0.1	0.5	0.08	0.12
		50	651.823	0.1	90	0.1	0.4	0.04	0.12	651.825	0.2	130	0.1	0.4	0.06	0.12
		60	651.823	0.1	70	0.1	0.3	0.04	0.10	651.825	0.2	100	0.1	0.4	0.06	0.10
		70	651.823	0.1	60	0.1	0.3	0.04	0.08	651.823	0.1	70	0.1	0.3	0.04	0.08
		75	651.823	0.1	40	0.1	0.3	0.04	0.08	651.823	0.1	40	0.1	0.3	0.04	0.08
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.837	0.2	150	0.1	0.5	0.06	0.14	651.737	0.3	220	0.1	0.5	0.08	0.14
		30	651.837	0.2	130	0.1	0.5	0.06	0.14	651.737	0.3	200	0.1	0.5	0.08	0.14
		40	651.837	0.2	110	0.1	0.5	0.06	0.12	651.737	0.3	180	0.1	0.5	0.08	0.12
		50	651.824	0.1	90	0.1	0.4	0.04	0.12	651.837	0.2	130	0.1	0.4	0.06	0.12
		60	651.824	0.1	70	0.1	0.3	0.04	0.10	651.837	0.2	100	0.1	0.4	0.06	0.10
		70	651.824	0.1	60	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		75	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	40	0.1	0.3	0.04	0.08
S	Titanium 3.7164	20	651.837	0.2	100	0.1	0.5	0.06	0.12	651.737	0.3	120	0.1	0.5	0.08	0.12
		30	651.837	0.2	80	0.1	0.5	0.06	0.12	651.737	0.3	100	0.1	0.5	0.08	0.12
		40	651.824	0.1	60	0.1	0.4	0.04	0.10	651.837	0.2	80	0.1	0.4	0.06	0.10
		50	651.824	0.1	50	0.1	0.4	0.04	0.10	651.837	0.2	70	0.1	0.4	0.06	0.10
		60	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	60	0.1	0.3	0.04	0.08
		70	651.824	0.1	30	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	25	0.1	0.3	0.04	0.07	651.824	0.1	30	0.1	0.3	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		30	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		40	651.824	0.1	30	0.1	0.3	0.04	0.08	651.839	0.2	30	0.1	0.3	0.06	0.08
		50	651.824	0.1	30	0.1	0.3	0.04	0.08	651.824	0.1	30	0.1	0.3	0.04	0.08
		60	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06

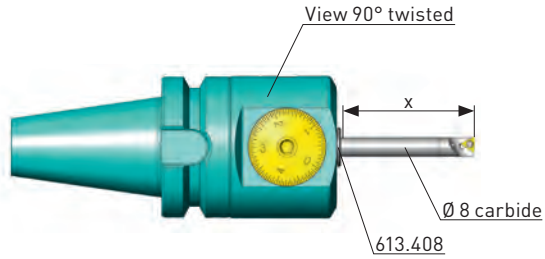
When applying the optimized cutting data:

- the boring diameter of 8.8 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



	Workpiece material	Boring depth	universal Ø 8.8 - 13.8 mm							optimized Ø 8.8 - 9.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.738	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.738	0.3	160	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	120	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.738	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.738	0.3	160	0.1	0.5	0.08	0.12
		40	651.824	0.1	90	0.1	0.4	0.04	0.10	651.838	0.2	120	0.1	0.4	0.06	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	160	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	130	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
K	Gray cast iron GG15 GG 20 GG 25 GG 30	20	651.837	0.2	130	0.1	0.6	0.06	0.12	651.735	0.3	200	0.1	0.6	0.08	0.12
		30	651.837	0.2	110	0.1	0.6	0.06	0.12	651.735	0.3	160	0.1	0.6	0.08	0.12
		40	651.837	0.2	90	0.1	0.6	0.06	0.10	651.735	0.3	120	0.1	0.6	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.4	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07

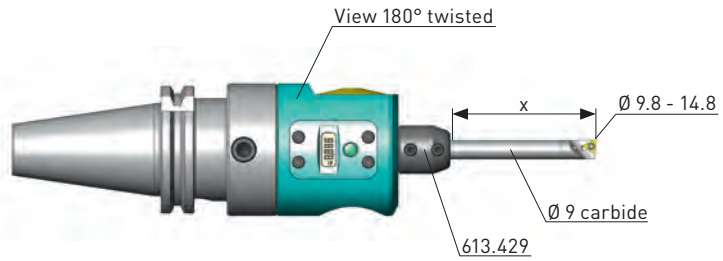
Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 8.8 - 13.8 mm							optimized Ø 8.8 - 9.8 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	20	651.837	0.2	130	0.1	0.5	0.06	0.12	651.735	0.3	200	0.1	0.5	0.08	0.12
		30	651.837	0.2	110	0.1	0.5	0.06	0.12	651.735	0.3	160	0.1	0.5	0.08	0.12
		40	651.837	0.2	90	0.1	0.4	0.06	0.10	651.735	0.3	120	0.1	0.5	0.08	0.10
		50	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	100	0.1	0.4	0.06	0.10
		60	651.824	0.1	55	0.1	0.3	0.04	0.08	651.834	0.2	70	0.1	0.4	0.06	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	45	0.1	0.3	0.04	0.07
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	20	651.837	0.2	130	0.1	0.5	0.06	0.10	651.737	0.3	180	0.1	0.5	0.08	0.10
		30	651.837	0.2	110	0.1	0.5	0.06	0.10	651.737	0.3	150	0.1	0.5	0.08	0.10
		40	651.824	0.1	90	0.1	0.4	0.04	0.08	651.837	0.2	110	0.1	0.4	0.06	0.08
		50	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	100	0.1	0.4	0.06	0.08
		60	651.824	0.1	55	0.1	0.3	0.04	0.06	651.824	0.1	70	0.1	0.3	0.04	0.06
		70	651.824	0.1	40	0.1	0.3	0.04	0.06	651.824	0.1	50	0.1	0.3	0.04	0.06
		75	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	45	0.1	0.3	0.04	0.06
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	20	651.825	0.2	180	0.1	0.5	0.06	0.14	651.723	0.3	260	0.1	0.5	0.08	0.14
		30	651.825	0.2	170	0.1	0.5	0.06	0.14	651.723	0.3	260	0.1	0.5	0.08	0.14
		40	651.825	0.2	150	0.1	0.5	0.06	0.12	651.723	0.3	200	0.1	0.5	0.08	0.12
		50	651.823	0.1	120	0.1	0.4	0.04	0.12	651.825	0.2	150	0.1	0.4	0.06	0.12
		60	651.823	0.1	80	0.1	0.3	0.04	0.10	651.825	0.2	120	0.1	0.4	0.06	0.10
		70	651.823	0.1	70	0.1	0.3	0.04	0.08	651.823	0.1	80	0.1	0.3	0.04	0.08
		75	651.823	0.1	60	0.1	0.3	0.04	0.08	651.823	0.1	70	0.1	0.3	0.04	0.08
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	20	651.837	0.2	180	0.1	0.5	0.06	0.14	651.737	0.3	260	0.1	0.5	0.08	0.14
		30	651.837	0.2	170	0.1	0.5	0.06	0.14	651.737	0.3	260	0.1	0.5	0.08	0.14
		40	651.837	0.2	150	0.1	0.5	0.06	0.12	651.737	0.3	200	0.1	0.5	0.08	0.12
		50	651.824	0.1	120	0.1	0.4	0.04	0.12	651.837	0.2	150	0.1	0.4	0.06	0.12
		60	651.824	0.1	80	0.1	0.3	0.04	0.10	651.837	0.2	120	0.1	0.4	0.06	0.10
		70	651.824	0.1	70	0.1	0.3	0.04	0.08	651.824	0.1	80	0.1	0.3	0.04	0.08
		75	651.824	0.1	60	0.1	0.3	0.04	0.08	651.824	0.1	70	0.1	0.3	0.04	0.08
S	Titanium 3.7164	20	651.837	0.2	100	0.1	0.5	0.06	0.12	651.737	0.3	120	0.1	0.5	0.08	0.12
		30	651.837	0.2	80	0.1	0.5	0.06	0.12	651.737	0.3	100	0.1	0.5	0.08	0.12
		40	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	80	0.1	0.4	0.06	0.10
		50	651.824	0.1	60	0.1	0.4	0.04	0.10	651.837	0.2	70	0.1	0.4	0.06	0.10
		60	651.824	0.1	50	0.1	0.3	0.04	0.08	651.824	0.1	60	0.1	0.3	0.04	0.08
		70	651.824	0.1	40	0.1	0.3	0.04	0.08	651.824	0.1	50	0.1	0.3	0.04	0.08
		75	651.824	0.1	30	0.1	0.3	0.04	0.07	651.824	0.1	40	0.1	0.3	0.04	0.07
	Ni-basic-, Co-basic-, Alloys	20	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		30	651.839	0.2	50	0.1	0.4	0.06	0.10	651.839	0.2	50	0.1	0.4	0.06	0.10
		40	651.824	0.1	30	0.1	0.3	0.04	0.08	651.839	0.2	30	0.1	0.3	0.06	0.08
		50	651.824	0.1	30	0.1	0.3	0.04	0.08	651.824	0.1	30	0.1	0.3	0.04	0.08
		60	651.824	0.1	30	0.1	0.3	0.04	0.06	651.824	0.1	30	0.1	0.3	0.04	0.06

When applying the optimized cutting data:

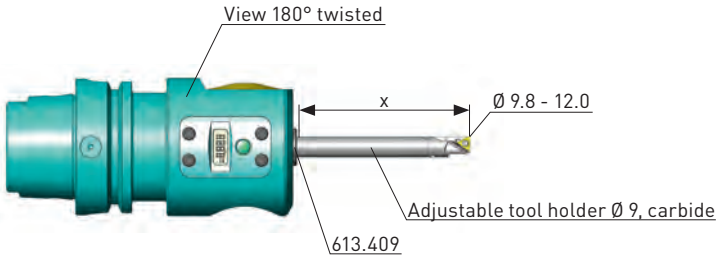
- the boring diameter of 9.8 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



universal

	Workpiece material	Boring depth	universal Ø 9.8 - 14.8 mm							optimized Ø 9.8 - 12.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	30	651.837	0.2	130	0.2	0.6	0.06	0.14	651.738	0.3	200	0.2	0.6	0.08	0.14
		40	651.837	0.2	110	0.2	0.6	0.06	0.14	651.738	0.3	160	0.2	0.6	0.08	0.14
		50	651.837	0.2	90	0.2	0.6	0.06	0.12	651.738	0.3	120	0.2	0.6	0.08	0.12
		60	651.824	0.1	70	0.1	0.4	0.04	0.12	651.838	0.2	100	0.2	0.4	0.06	0.12
		70	651.824	0.1	55	0.1	0.4	0.04	0.10	651.838	0.2	70	0.2	0.4	0.06	0.10
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	30	651.837	0.2	130	0.2	0.6	0.06	0.14	651.738	0.3	200	0.2	0.6	0.08	0.14
		40	651.837	0.2	110	0.2	0.6	0.06	0.14	651.738	0.3	160	0.2	0.6	0.08	0.14
		50	651.837	0.2	90	0.2	0.6	0.06	0.12	651.738	0.3	120	0.2	0.6	0.08	0.12
		60	651.824	0.1	70	0.1	0.4	0.04	0.12	651.838	0.2	100	0.2	0.4	0.06	0.12
		70	651.824	0.1	55	0.1	0.4	0.04	0.10	651.838	0.2	70	0.2	0.4	0.06	0.10
		85	651.824	0.1	40	0.2	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.2	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	30	651.837	0.2	130	0.2	0.6	0.06	0.12	651.737	0.3	180	0.2	0.6	0.08	0.12
		40	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
		60	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	55	0.1	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	30	651.837	0.2	130	0.2	0.6	0.06	0.12	651.737	0.3	180	0.2	0.6	0.08	0.12
		40	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
		60	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	55	0.1	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	30	651.837	0.2	130	0.2	0.6	0.06	0.12	651.737	0.3	160	0.2	0.6	0.08	0.12
		40	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	130	0.2	0.6	0.08	0.12
		50	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	110	0.2	0.6	0.08	0.10
		60	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	90	0.2	0.4	0.06	0.10
		70	651.824	0.1	55	0.1	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	30	651.837	0.2	130	0.2	0.8.	0.06	0.14	651.735	0.3	200	0.2	0.8.	0.08	0.14
		40	651.837	0.2	110	0.2	0.8	0.06	0.14	651.735	0.3	160	0.2	0.8	0.08	0.14
		50	651.837	0.2	90	0.2	0.6	0.06	0.12	651.735	0.3	120	0.2	0.6	0.08	0.12
		60	651.837	0.2	70	0.2	0.6	0.06	0.12	651.834	0.2	100	0.2	0.6	0.06	0.12
		70	651.824	0.1	55	0.1	0.4	0.04	0.10	651.834	0.2	70	0.2	0.4	0.06	0.10
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



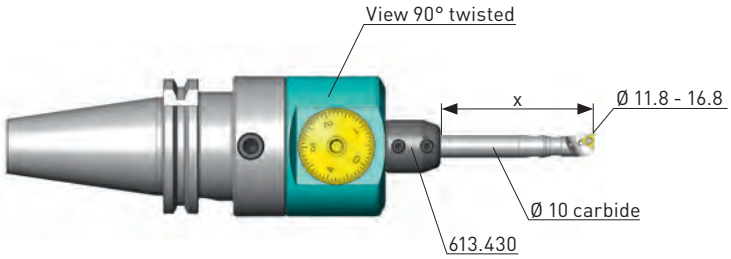
optimized

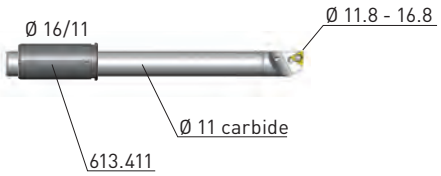
Workpiece material		Boring depth	universal Ø 9.8 - 14.8 mm							optimized Ø 9.8 - 12.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	30	651.837	0.2	130	0.2	0.6	0.06	0.14	651.735	0.3	200	0.2	0.6	0.08	0.14
		40	651.837	0.2	110	0.2	0.6	0.06	0.14	651.735	0.3	160	0.2	0.6	0.08	0.14
		50	651.837	0.2	90	0.2	0.6	0.06	0.12	651.735	0.3	120	0.2	0.6	0.08	0.12
		60	651.824	0.1	70	0.1	0.4	0.04	0.12	651.834	0.2	100	0.2	0.4	0.06	0.12
		70	651.824	0.1	55	0.1	0.4	0.04	0.10	651.834	0.2	70	0.2	0.4	0.06	0.10
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	30	651.837	0.2	130	0.2	0.6	0.06	0.12	651.737	0.3	180	0.2	0.6	0.08	0.12
		40	651.837	0.2	110	0.2	0.6	0.06	0.12	651.737	0.3	150	0.2	0.6	0.08	0.12
		50	651.837	0.2	90	0.2	0.6	0.06	0.10	651.737	0.3	120	0.2	0.6	0.08	0.10
		60	651.824	0.1	70	0.1	0.4	0.04	0.10	651.837	0.2	100	0.2	0.4	0.06	0.10
		70	651.824	0.1	55	0.1	0.4	0.04	0.08	651.837	0.2	70	0.2	0.4	0.06	0.08
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	50	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	30	651.825	0.2	180	0.2	0.6	0.06	0.16	651.723	0.3	300	0.2	0.6	0.08	0.16
		40	651.825	0.2	170	0.2	0.6	0.06	0.16	651.723	0.3	260	0.2	0.6	0.08	0.16
		50	651.825	0.2	140	0.2	0.6	0.06	0.14	651.723	0.3	200	0.2	0.6	0.08	0.14
		60	651.825	0.2	110	0.2	0.5	0.06	0.14	651.723	0.3	160	0.2	0.5	0.08	0.14
		70	651.823	0.1	80	0.1	0.4	0.04	0.12	651.825	0.2	120	0.2	0.4	0.06	0.12
		85	651.823	0.1	60	0.1	0.4	0.04	0.12	651.823	0.1	80	0.1	0.4	0.04	0.12
		100	651.823	0.1	40	0.1	0.4	0.04	0.10	651.823	0.1	40	0.1	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	30	651.837	0.2	180	0.2	0.6	0.06	0.16	651.737	0.3	300	0.2	0.6	0.08	0.16
		40	651.837	0.2	170	0.2	0.6	0.06	0.16	651.737	0.3	260	0.2	0.6	0.08	0.16
		50	651.837	0.2	140	0.2	0.6	0.06	0.14	651.737	0.3	200	0.2	0.6	0.08	0.14
		60	651.824	0.1	110	0.2	0.5	0.04	0.12	651.737	0.3	160	0.2	0.5	0.08	0.14
		70	651.824	0.1	80	0.1	0.4	0.04	0.12	651.837	0.2	120	0.2	0.4	0.06	0.12
		85	651.824	0.1	60	0.1	0.4	0.04	0.12	651.824	0.1	80	0.1	0.4	0.04	0.12
		100	651.824	0.1	40	0.1	0.4	0.04	0.10	651.824	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	30	651.837	0.2	100	0.2	0.6	0.06	0.14	651.737	0.3	120	0.2	0.6	0.08	0.14
		40	651.837	0.2	80	0.2	0.6	0.06	0.14	651.737	0.3	100	0.2	0.6	0.08	0.14
		50	651.837	0.2	70	0.2	0.6	0.06	0.12	651.837	0.2	80	0.2	0.6	0.06	0.12
		60	651.824	0.1	60	0.1	0.4	0.04	0.12	651.837	0.2	70	0.2	0.4	0.06	0.12
		70	651.824	0.1	50	0.1	0.4	0.04	0.10	651.824	0.1	60	0.1	0.4	0.04	0.10
		85	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	40	0.1	0.4	0.04	0.08
		100	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	30	651.839	0.2	50	0.1	0.5	0.06	0.12	651.839	0.2	50	0.1	0.5	0.06	0.12
		40	651.839	0.2	50	0.1	0.5	0.06	0.12	651.839	0.2	50	0.1	0.5	0.06	0.12
		50	651.839	0.2	30	0.1	0.5	0.06	0.10	651.839	0.2	30	0.1	0.5	0.06	0.10
		60	651.824	0.1	30	0.1	0.4	0.04	0.08	651.839	0.2	30	0.1	0.4	0.06	0.08
		70	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 12.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



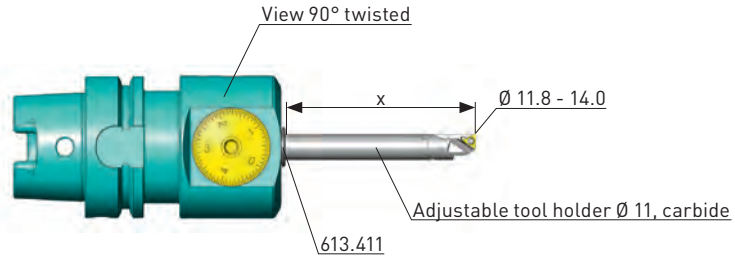


universal

	Workpiece material	Boring depth	universal Ø 11.8 - 16.8 mm							optimized Ø 11.8 - 14.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	30	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		45	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	200	0.2	0.8	0.08	0.14
		60	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	150	0.2	0.6	0.08	0.12
		75	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	120	0.2	0.6	0.06	0.12
		90	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.2	0.4	0.06	0.10
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	30	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		45	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	200	0.2	0.8	0.08	0.14
		60	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	150	0.2	0.6	0.08	0.12
		75	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	120	0.2	0.6	0.06	0.12
		90	651.824	0.1	70	0.1	0.4	0.04	0.10	651.838	0.2	90	0.2	0.4	0.06	0.10
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	190	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	150	0.2	0.6	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		90	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.2	0.4	0.06	0.08
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	190	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	150	0.2	0.6	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		90	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.2	0.4	0.06	0.08
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	200	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	180	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	150	0.2	0.6	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		90	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.2	0.4	0.06	0.08
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	30	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		45	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	200	0.2	0.8	0.10	0.14
		60	651.834	0.2	125	0.2	0.6	0.06	0.12	651.735	0.3	150	0.2	0.6	0.08	0.12
		75	651.834	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	120	0.2	0.6	0.06	0.12
		90	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.2	0.4	0.06	0.10
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For universal applications there are tool holders with shank Ø 10.0 and Ø 11.0 mm available in different lengths and with screw on or soldered insert holders available. The cutting data are for all tool holders the same.



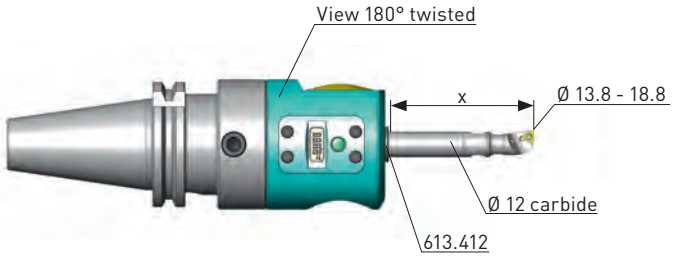
optimized

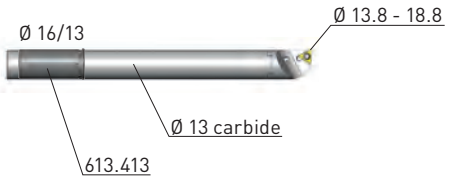
	Workpiece material	Boring depth	universal Ø 11.8 - 16.8							optimized Ø 11.8 - 14.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	30	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		45	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	200	0.2	0.8	0.10	0.14
		60	651.834	0.2	125	0.2	0.6	0.06	0.12	651.735	0.3	150	0.2	0.6	0.08	0.12
		75	651.834	0.2	100	0.2	0.6	0.06	0.12	651.834	0.2	120	0.2	0.6	0.06	0.12
		90	651.824	0.1	70	0.1	0.4	0.04	0.10	651.834	0.2	90	0.2	0.4	0.06	0.10
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	30	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		45	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	190	0.2	0.8	0.08	0.12
		60	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	150	0.2	0.6	0.08	0.10
		75	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	120	0.2	0.6	0.06	0.10
		90	651.824	0.1	70	0.1	0.4	0.04	0.08	651.837	0.2	90	0.2	0.4	0.06	0.08
		105	651.824	0.1	45	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	30	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	350	0.2	0.8	0.10	0.16
		45	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	320	0.2	0.8	0.10	0.16
		60	651.723	0.3	170	0.2	0.6	0.08	0.14	651.723	0.3	250	0.2	0.6	0.08	0.14
		75	651.825	0.2	150	0.2	0.6	0.06	0.14	651.723	0.3	180	0.2	0.6	0.08	0.14
		90	651.825	0.2	110	0.2	0.4	0.06	0.12	651.825	0.2	130	0.2	0.4	0.06	0.12
		105	651.823	0.1	70	0.1	0.4	0.04	0.12	651.823	0.1	80	0.1	0.4	0.04	0.12
		120	651.823	0.1	30	0.1	0.4	0.04	0.10	651.823	0.1	40	0.1	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	30	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	350	0.2	0.8	0.08	0.16
		45	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	320	0.2	0.8	0.08	0.16
		60	651.737	0.3	170	0.2	0.6	0.08	0.14	651.737	0.3	250	0.2	0.6	0.08	0.14
		75	651.837	0.2	150	0.2	0.6	0.06	0.14	651.737	0.3	180	0.2	0.6	0.08	0.14
		90	651.837	0.2	110	0.2	0.4	0.06	0.12	651.837	0.2	130	0.2	0.4	0.06	0.12
		105	651.824	0.1	70	0.1	0.4	0.04	0.12	651.824	0.1	80	0.1	0.4	0.04	0.12
		120	651.824	0.1	30	0.1	0.4	0.04	0.10	651.824	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	30	651.737	0.3	100	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		45	651.737	0.3	80	0.2	0.8	0.08	0.14	651.737	0.3	100	0.2	0.8	0.08	0.14
		60	651.837	0.2	70	0.2	0.6	0.06	0.12	651.837	0.2	80	0.2	0.6	0.06	0.12
		75	651.837	0.2	60	0.2	0.6	0.06	0.12	651.837	0.2	70	0.2	0.6	0.06	0.12
		90	651.824	0.1	50	0.1	0.4	0.04	0.10	651.824	0.1	60	0.1	0.4	0.04	0.10
		105	651.824	0.1	40	0.1	0.4	0.04	0.08	651.824	0.1	40	0.1	0.4	0.04	0.08
		120	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	30	651.839	0.2	50	0.1	0.6	0.06	0.12	651.839	0.2	50	0.1	0.6	0.06	0.12
		45	651.839	0.2	50	0.1	0.6	0.06	0.12	651.839	0.2	50	0.1	0.6	0.06	0.12
		60	651.839	0.2	30	0.1	0.6	0.06	0.10	651.839	0.2	30	0.1	0.6	0.06	0.10
		75	651.824	0.1	30	0.1	0.4	0.04	0.10	651.839	0.2	30	0.1	0.4	0.06	0.10
		90	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
		105	651.824	0.1	20	0.1	0.4	0.04	0.08	651.824	0.1	20	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 14.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



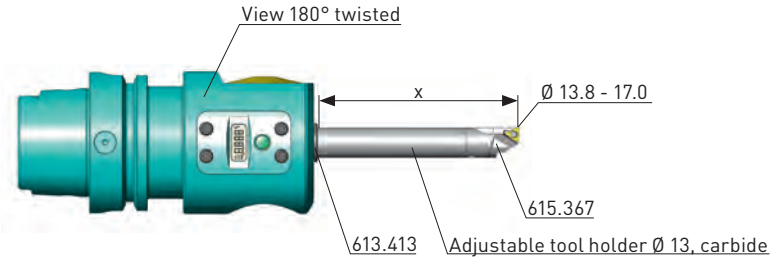


universal

	Workpiece material	Boring depth	universal Ø 13.8 - 18.8 mm							optimized Ø 13.8 - 17.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	651.737	0.3	170	0.2	0.8	0.08	0.14	651.738	0.3	260	0.2	0.8	0.08	0.14
		55	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		70	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	200	0.2	0.8	0.08	0.12
		85	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
		100	651.837	0.2	80	0.2	0.6	0.06	0.10	651.838	0.2	120	0.2	0.6	0.06	0.10
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	651.737	0.3	170	0.2	0.8	0.08	0.14	651.738	0.3	260	0.2	0.8	0.08	0.14
		55	651.737	0.3	150	0.2	0.8	0.08	0.14	651.738	0.3	240	0.2	0.8	0.08	0.14
		70	651.837	0.2	125	0.2	0.6	0.06	0.12	651.738	0.3	200	0.2	0.8	0.08	0.12
		85	651.837	0.2	100	0.2	0.6	0.06	0.12	651.838	0.2	160	0.2	0.6	0.06	0.12
		100	651.837	0.2	80	0.2	0.6	0.06	0.10	651.838	0.2	120	0.2	0.6	0.06	0.10
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	240	0.2	0.8	0.08	0.12
		55	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		70	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
		85	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		100	651.824	0.1	80	0.2	0.6	0.04	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	240	0.2	0.8	0.08	0.12
		55	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		70	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
		85	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		100	651.824	0.1	80	0.2	0.6	0.04	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		55	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		70	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
		85	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		100	651.824	0.1	80	0.2	0.6	0.04	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	40	651.735	0.3	170	0.2	0.8	0.08	0.14	651.734	0.4	260	0.2	0.8	0.10	0.14
		55	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		70	651.735	0.3	125	0.2	0.8	0.08	0.12	651.735	0.3	200	0.2	0.8	0.08	0.12
		85	651.834	0.2	100	0.2	0.6	0.06	0.12	651.735	0.3	160	0.2	0.6	0.08	0.12
		100	651.834	0.2	80	0.2	0.6	0.06	0.10	651.834	0.2	120	0.2	0.6	0.06	0.10
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.834	0.2	70	0.2	0.4	0.06	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

For universal applications there are tool holders with shank Ø 12.0 and Ø 13.0 mm available in different lengths and with screw on or soldered insert holders available. The cutting data are for all tool holders the same.



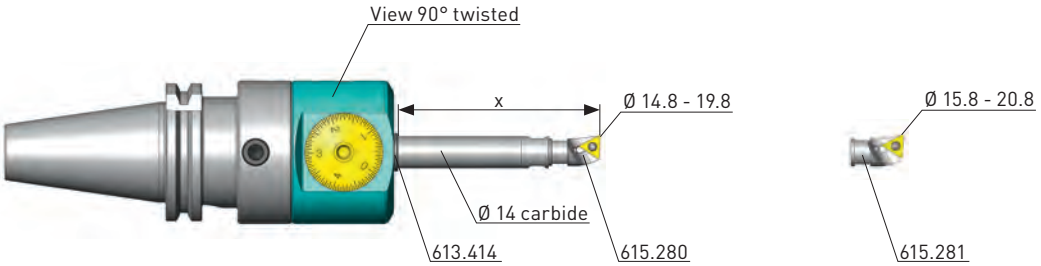
optimized

Workpiece material		Boring depth	universal Ø 13.8 - 18.8 mm							optimized Ø 13.8 - 17.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	651.735	0.3	170	0.2	0.8	0.08	0.14	651.734	0.4	260	0.2	0.8	0.10	0.14
		55	651.735	0.3	150	0.2	0.8	0.08	0.14	651.734	0.4	240	0.2	0.8	0.10	0.14
		70	651.735	0.3	125	0.2	0.8	0.08	0.12	651.735	0.3	200	0.2	0.6	0.08	0.12
		85	651.834	0.2	100	0.2	0.6	0.06	0.12	651.735	0.3	160	0.2	0.6	0.08	0.12
		100	651.834	0.2	80	0.2	0.6	0.06	0.10	651.834	0.2	120	0.2	0.4	0.06	0.10
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.834	0.2	70	0.2	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	651.737	0.3	170	0.2	0.8	0.08	0.12	651.737	0.3	240	0.2	0.8	0.08	0.12
		55	651.737	0.3	150	0.2	0.8	0.08	0.12	651.737	0.3	220	0.2	0.8	0.08	0.12
		70	651.837	0.2	125	0.2	0.6	0.06	0.10	651.737	0.3	190	0.2	0.8	0.08	0.10
		85	651.837	0.2	100	0.2	0.6	0.06	0.10	651.837	0.2	160	0.2	0.6	0.06	0.10
		100	651.824	0.1	80	0.2	0.6	0.04	0.08	651.837	0.2	120	0.2	0.6	0.06	0.08
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	70	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	420	0.2	0.8	0.10	0.16
		55	651.723	0.3	200	0.2	0.8	0.08	0.16	651.725	0.4	420	0.2	0.8	0.10	0.16
		70	651.723	0.3	180	0.2	0.8	0.08	0.14	651.723	0.3	300	0.2	0.8	0.08	0.14
		85	651.825	0.2	150	0.2	0.6	0.06	0.14	651.723	0.3	260	0.2	0.8	0.08	0.14
		100	651.825	0.2	110	0.2	0.6	0.06	0.12	651.825	0.2	190	0.2	0.6	0.06	0.12
		115	651.823	0.1	80	0.1	0.4	0.04	0.12	651.825	0.2	110	0.2	0.6	0.06	0.12
		130	651.823	0.1	40	0.1	0.4	0.04	0.10	651.823	0.1	40	0.1	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	420	0.2	0.8	0.08	0.16
		55	651.737	0.3	200	0.2	0.8	0.08	0.16	651.737	0.3	420	0.2	0.8	0.08	0.16
		70	651.737	0.3	180	0.2	0.8	0.08	0.14	651.737	0.3	300	0.2	0.8	0.08	0.14
		85	651.837	0.2	150	0.2	0.6	0.06	0.14	651.737	0.3	260	0.2	0.8	0.08	0.14
		100	651.837	0.2	110	0.2	0.6	0.06	0.12	651.837	0.2	190	0.2	0.6	0.06	0.12
		115	651.824	0.1	80	0.1	0.4	0.04	0.10	651.837	0.2	110	0.2	0.6	0.06	0.10
		130	651.824	0.1	40	0.1	0.4	0.04	0.10	651.824	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	40	651.737	0.3	120	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		55	651.737	0.3	120	0.2	0.8	0.08	0.14	651.737	0.3	120	0.2	0.8	0.08	0.14
		70	651.837	0.2	100	0.2	0.6	0.06	0.12	651.837	0.2	120	0.2	0.6	0.06	0.12
		85	651.837	0.2	90	0.2	0.6	0.06	0.12	651.837	0.2	100	0.2	0.6	0.06	0.12
		100	651.824	0.1	80	0.1	0.4	0.04	0.10	651.824	0.1	80	0.1	0.4	0.04	0.10
		115	651.824	0.1	60	0.1	0.4	0.04	0.08	651.824	0.1	60	0.1	0.4	0.04	0.08
		130	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	40	651.839	0.2	50	0.1	0.6	0.06	0.12	651.839	0.2	50	0.1	0.6	0.06	0.12
		55	651.839	0.2	50	0.1	0.6	0.06	0.12	651.839	0.2	50	0.1	0.6	0.06	0.12
		70	651.839	0.2	50	0.1	0.6	0.06	0.10	651.839	0.2	50	0.1	0.6	0.06	0.10
		85	651.824	0.1	30	0.1	0.6	0.04	0.10	651.839	0.2	30	0.1	0.6	0.06	0.10
		100	651.824	0.1	30	0.1	0.4	0.04	0.08	651.824	0.1	30	0.1	0.4	0.04	0.08
		115	651.824	0.1	25	0.1	0.4	0.04	0.08	651.824	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 17.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

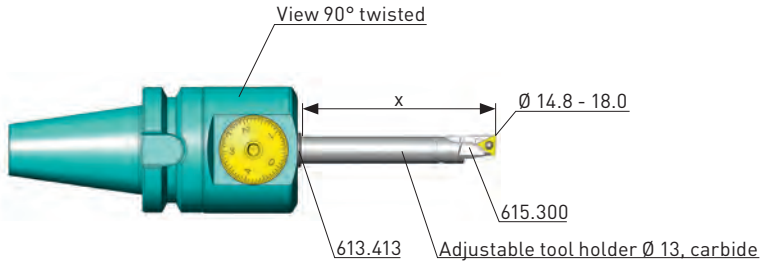


universal

	Workpiece material	Boring depth	universal Ø 14.8 - 19.8 / 20.8 mm							optimized Ø 14.8-18.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	180	0.2	1.0	0.10	0.18	655.334	0.8	300	0.2	1.2	0.14	0.20
		55	655.318	0.4	180	0.2	1.0	0.10	0.18	655.385	0.4	280	0.2	1.0	0.10	0.16
		70	655.318	0.4	180	0.2	0.8	0.10	0.14	655.385	0.4	240	0.2	1.0	0.10	0.14
		85	655.319	0.2	140	0.2	0.8	0.06	0.10	655.375	0.2	180	0.2	0.8	0.06	0.12
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	140	0.2	0.6	0.06	0.10
		115	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		130	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	180	0.2	1.0	0.10	0.18	655.334	0.8	300	0.2	1.2	0.14	0.20
		55	655.318	0.4	180	0.2	1.0	0.10	0.18	655.385	0.4	280	0.2	1.0	0.10	0.16
		70	655.318	0.4	180	0.2	0.8	0.10	0.14	655.385	0.4	240	0.2	1.0	0.10	0.14
		85	655.319	0.2	140	0.2	0.8	0.06	0.10	655.375	0.2	180	0.2	0.8	0.06	0.12
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.375	0.2	140	0.2	0.6	0.06	0.10
		115	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		130	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	180	0.2	1.0	0.10	0.16	655.320	0.8	280	0.2	1.2	0.14	0.16
		55	655.318	0.4	180	0.2	1.0	0.10	0.16	655.318	0.4	260	0.2	1.0	0.10	0.14
		70	655.318	0.4	180	0.2	0.8	0.10	0.14	655.318	0.4	220	0.2	1.0	0.10	0.12
		85	655.319	0.2	140	0.2	0.8	0.06	0.10	655.319	0.2	160	0.2	0.8	0.06	0.10
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.08
		115	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		130	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	180	0.2	1.0	0.10	0.16	655.320	0.8	280	0.2	1.2	0.14	0.16
		55	655.318	0.4	180	0.2	1.0	0.10	0.16	655.318	0.4	260	0.2	1.0	0.10	0.14
		70	655.318	0.4	180	0.2	0.8	0.10	0.14	655.318	0.4	220	0.2	1.0	0.10	0.12
		85	655.319	0.2	140	0.2	0.8	0.06	0.10	655.319	0.2	160	0.2	0.8	0.06	0.10
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.08
		115	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		130	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	180	0.2	1.0	0.10	0.16	655.320	0.8	260	0.2	1.2	0.14	0.16
		55	655.318	0.4	180	0.2	1.0	0.10	0.16	655.318	0.4	240	0.2	1.0	0.10	0.14
		70	655.318	0.4	180	0.2	0.8	0.10	0.14	655.318	0.4	200	0.2	1.0	0.10	0.12
		85	655.319	0.2	140	0.2	0.8	0.06	0.10	655.319	0.2	160	0.2	0.8	0.06	0.10
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.08
		115	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		130	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	40	655.380	0.4	180	0.2	1.2	0.10	0.18	655.303A	0.8	300	0.2	1.2	0.14	0.20
		55	655.380	0.4	180	0.2	1.2	0.10	0.18	655.390	0.8	280	0.2	1.0	0.14	0.16
		70	655.380	0.4	180	0.2	1.0	0.10	0.14	655.390	0.8	240	0.2	1.0	0.14	0.14
		85	655.370	0.2	140	0.2	0.8	0.06	0.10	655.380	0.4	180	0.2	0.8	0.10	0.12
		100	655.370	0.2	100	0.2	0.6	0.06	0.10	655.380	0.4	140	0.2	0.6	0.10	0.10
		115	655.363	0.1	60	0.1	0.4	0.04	0.08	655.363	0.1	80	0.1	0.4	0.04	0.08
		130	655.363	0.1	30	0.1	0.4	0.04	0.08	655.363	0.1	40	0.1	0.4	0.04	0.08

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.280 and 615.281 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



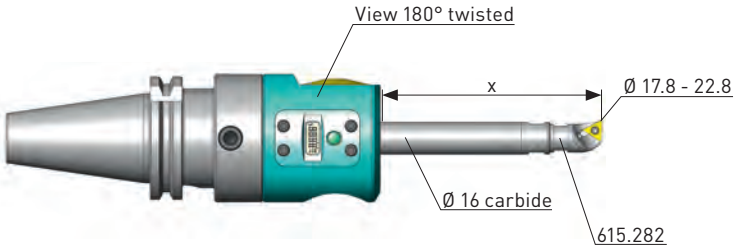
optimized

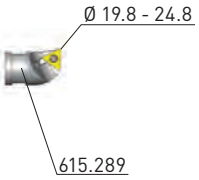
	Workpiece material	Boring depth	universal Ø 14.8 - 19.8 / 20.8 mm							optimized Ø 14.8 - 18.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	180	0.2	1.0	0.10	0.18	655.303A	0.8	300	0.2	1.2	0.14	0.20
		50	655.380	0.4	180	0.2	1.0	0.10	0.18	655.390	0.8	280	0.2	1.0	0.14	0.16
		60	655.380	0.4	180	0.2	0.8	0.10	0.14	655.390	0.8	240	0.2	1.0	0.14	0.14
		80	655.370	0.2	140	0.2	0.8	0.06	0.10	655.380	0.4	180	0.2	0.8	0.10	0.12
		100	655.370	0.2	100	0.2	0.6	0.06	0.10	655.380	0.4	140	0.2	0.6	0.10	0.10
		120	655.363	0.1	60	0.1	0.4	0.04	0.08	655.363	0.1	80	0.1	0.4	0.04	0.08
		135	655.363	0.1	30	0.1	0.4	0.04	0.08	655.363	0.1	40	0.1	0.4	0.04	0.08
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	180	0.2	1.0	0.10	0.16	655.320	0.8	280	0.2	1.2	0.14	0.16
		50	655.318	0.4	180	0.2	1.0	0.10	0.16	655.318	0.4	260	0.2	1.0	0.10	0.14
		60	655.318	0.4	180	0.2	0.8	0.10	0.14	655.318	0.4	220	0.2	1.0	0.10	0.12
		80	655.319	0.2	140	0.2	0.8	0.06	0.10	655.319	0.2	160	0.2	0.8	0.06	0.10
		100	655.319	0.2	100	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.08
		120	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	80	0.1	0.4	0.04	0.08
		135	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	40	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	200	0.2	1.0	0.10	0.20	655.397	0.8	500	0.2	1.5	0.14	0.22
		50	655.388	0.4	200	0.2	1.0	0.10	0.20	655.398	0.8	450	0.2	1.5	0.14	0.20
		60	655.388	0.4	200	0.2	0.8	0.10	0.16	655.388	0.4	350	0.2	1.2	0.10	0.18
		80	655.378	0.2	180	0.2	0.8	0.06	0.14	655.388	0.4	300	0.2	1.0	0.10	0.16
		100	655.378	0.2	150	0.2	0.6	0.06	0.12	655.378	0.2	200	0.2	0.8	0.06	0.14
		120	655.378	0.2	100	0.2	0.6	0.06	0.10	655.378	0.2	150	0.2	0.6	0.06	0.12
		135	655.363	0.1	40	0.1	0.6	0.04	0.10	655.363	0.1	80	0.1	0.4	0.04	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	200	0.2	1.0	0.10	0.20	655.320	0.8	500	0.2	1.5	0.14	0.22
		50	655.318	0.4	200	0.2	1.0	0.10	0.20	655.320	0.8	450	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	0.8	0.10	0.16	655.318	0.4	350	0.2	1.2	0.10	0.18
		80	655.319	0.2	180	0.2	0.8	0.06	0.14	655.318	0.4	300	0.2	1.0	0.10	0.16
		100	655.319	0.2	150	0.2	0.6	0.06	0.12	655.319	0.2	200	0.2	0.8	0.06	0.14
		120	655.369	0.1	100	0.1	0.4	0.04	0.10	655.319	0.2	150	0.2	0.6	0.06	0.12
		135	655.369	0.1	40	0.1	0.4	0.04	0.10	655.369	0.1	80	0.1	0.4	0.04	0.10
S	Titanium 3.7164	40	655.318	0.4	120	0.2	1.0	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.16
		50	655.318	0.4	120	0.2	1.0	0.10	0.18	655.318	0.4	120	0.2	1.5	0.10	0.14
		60	655.318	0.4	120	0.2	0.8	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.12
		80	655.319	0.2	100	0.2	0.8	0.06	0.10	655.319	0.2	100	0.2	1.0	0.06	0.10
		100	655.319	0.2	80	0.2	0.6	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.08
		120	655.369	0.1	60	0.1	0.4	0.04	0.08	655.369	0.1	60	0.1	0.6	0.04	0.08
		135	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.1	0.8	0.10	0.14	655.326	0.4	50	0.1	0.8	0.10	0.14
		50	655.326	0.4	50	0.1	0.8	0.10	0.14	655.326	0.4	50	0.1	0.8	0.10	0.12
		60	655.316	0.2	40	0.1	0.6	0.06	0.12	655.316	0.2	40	0.1	0.6	0.06	0.10
		80	655.316	0.2	30	0.1	0.6	0.06	0.12	655.316	0.2	30	0.1	0.6	0.06	0.10
		100	655.369	0.1	30	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
		120	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 18.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required



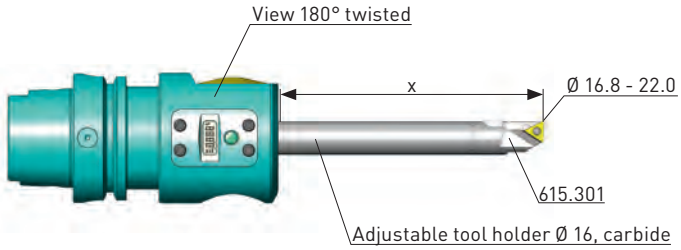


universal

	Workpiece material	Boring depth	universal Ø 17.8 - 22.8 / 24.8 mm							optimized Ø 16.8 - 22.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	250	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	220	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.2	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	40	655.380	0.4	200	0.2	2.0	0.10	0.18	655.303A	0.8	350	0.2	2.0	0.14	0.25
		60	655.380	0.4	200	0.2	1.8	0.10	0.18	655.303A	0.8	350	0.2	1.8	0.14	0.22
		80	655.380	0.4	200	0.2	1.5	0.10	0.14	655.390	0.8	300	0.2	1.5	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.282 and 615.289 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



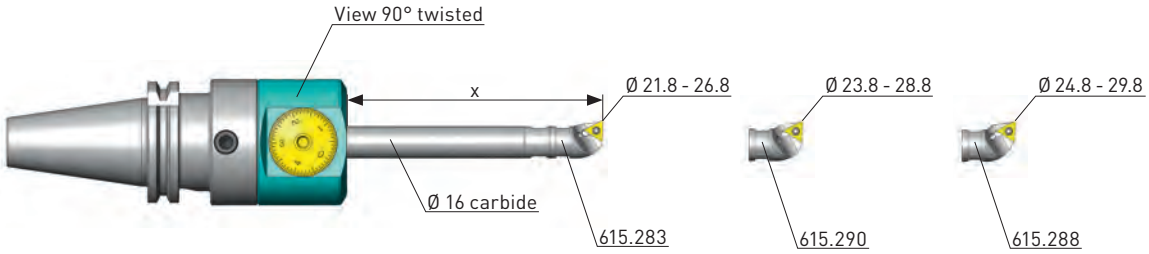
optimized

	Workpiece material	Boring depth	universal Ø 17.8 - 22.8 /24.8 mm							optimized Ø 16.8 - 22.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.25
		60	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.22
		80	655.380	0.4	200	0.2	1.2	0.10	0.14	655.390	0.8	300	0.2	1.2	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	780	0.2	1.5	0.14	0.30
		60	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	700	0.2	1.5	0.14	0.30
		80	655.388	0.4	240	0.2	1.2	0.10	0.16	655.397	0.8	650	0.2	1.2	0.14	0.25
		100	655.388	0.4	200	0.2	1.0	0.10	0.14	655.398	0.8	400	0.2	1.0	0.14	0.20
		120	655.378	0.2	180	0.2	0.8	0.06	0.12	655.388	0.4	250	0.2	0.8	0.10	0.16
		140	655.378	0.2	110	0.2	0.6	0.06	0.10	655.378	0.2	120	0.2	0.6	0.06	0.12
		160	655.378	0.2	30	0.2	0.4	0.06	0.10	655.378	0.2	40	0.2	0.4	0.06	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		60	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		80	655.318	0.4	240	0.2	1.2	0.10	0.16	655.320	0.8	650	0.2	1.2	0.14	0.25
		100	655.318	0.4	200	0.2	1.0	0.10	0.14	655.318	0.4	400	0.2	1.0	0.10	0.20
		120	655.319	0.2	180	0.2	0.8	0.06	0.12	655.318	0.4	250	0.2	0.8	0.10	0.16
		140	655.319	0.2	110	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.12
		160	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	40	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		60	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		80	655.318	0.4	120	0.2	1.2	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.18
		100	655.318	0.4	100	0.2	1.0	0.10	0.10	655.318	0.4	100	0.2	1.0	0.10	0.14
		120	655.319	0.2	80	0.2	0.8	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.12
		140	655.369	0.1	60	0.1	0.6	0.04	0.08	655.319	0.2	60	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		60	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		80	655.316	0.2	40	0.1	0.8	0.06	0.12	655.326	0.4	40	0.1	0.8	0.10	0.12
		100	655.316	0.2	30	0.1	0.6	0.06	0.10	655.316	0.2	30	0.1	0.6	0.06	0.10
		120	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	30	0.1	0.4	0.04	0.10
		140	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 22.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

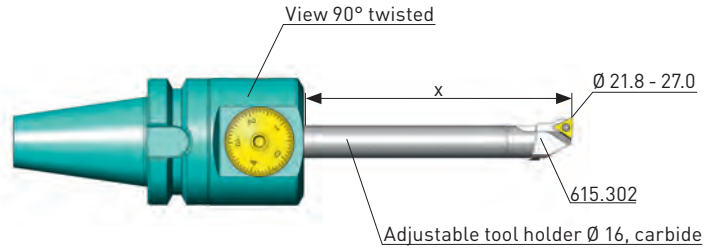


universal

	Workpiece material	Boring depth	universal Ø 21.8 - 26.8 / 28.8 / 29.8 mm							optimized Ø 21.8 - 27.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	250	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	220	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	40	655.380	0.4	200	0.2	2.0	0.10	0.18	655.303A	0.8	350	0.2	2.0	0.14	0.25
		60	655.380	0.4	200	0.2	1.8	0.10	0.18	655.303A	0.8	350	0.2	1.8	0.14	0.22
		80	655.380	0.4	200	0.2	1.5	0.10	0.14	655.390	0.8	300	0.2	1.5	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.283, 615.290 and 615.288 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



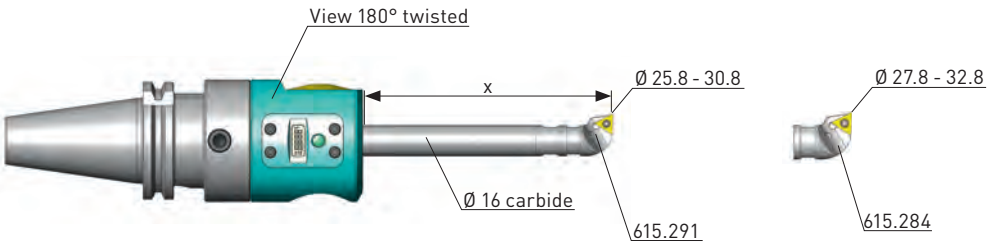
optimized

Workpiece material		Boring depth	universal Ø 21.8 - 26.8 / 28.8 / 29.8 mm							optimized Ø 21.8 - 27.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.25
		60	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.22
		80	655.380	0.4	200	0.2	1.2	0.10	0.14	655.390	0.8	300	0.2	1.2	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	950	0.2	1.5	0.14	0.30
		60	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	850	0.2	1.5	0.14	0.30
		80	655.388	0.4	240	0.2	1.2	0.10	0.16	655.397	0.8	650	0.2	1.2	0.14	0.25
		100	655.388	0.4	200	0.2	1.0	0.10	0.14	655.398	0.8	400	0.2	1.0	0.14	0.20
		120	655.378	0.2	180	0.2	0.8	0.06	0.12	655.388	0.4	250	0.2	0.8	0.10	0.16
		140	655.378	0.2	110	0.2	0.6	0.06	0.10	655.378	0.2	120	0.2	0.6	0.06	0.12
		160	655.378	0.2	30	0.2	0.4	0.06	0.10	655.378	0.2	40	0.2	0.4	0.06	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		60	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		80	655.318	0.4	240	0.2	1.2	0.10	0.16	655.320	0.8	650	0.2	1.2	0.14	0.25
		100	655.318	0.4	200	0.2	1.0	0.10	0.14	655.318	0.4	400	0.2	1.0	0.10	0.20
		120	655.319	0.2	180	0.2	0.8	0.06	0.12	655.318	0.4	250	0.2	0.8	0.10	0.16
		140	655.319	0.2	110	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.12
		160	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	40	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		60	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		80	655.318	0.4	120	0.2	1.2	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.18
		100	655.318	0.4	100	0.2	1.0	0.10	0.10	655.318	0.4	100	0.2	1.0	0.10	0.14
		120	655.319	0.2	80	0.2	0.8	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.12
		140	655.369	0.1	60	0.1	0.6	0.04	0.08	655.319	0.2	60	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		60	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		80	655.316	0.2	40	0.1	0.8	0.06	0.12	655.326	0.4	40	0.1	0.8	0.10	0.12
		100	655.316	0.2	30	0.1	0.6	0.06	0.10	655.316	0.2	30	0.1	0.6	0.06	0.10
		120	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	30	0.1	0.4	0.04	0.10
		140	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 27.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

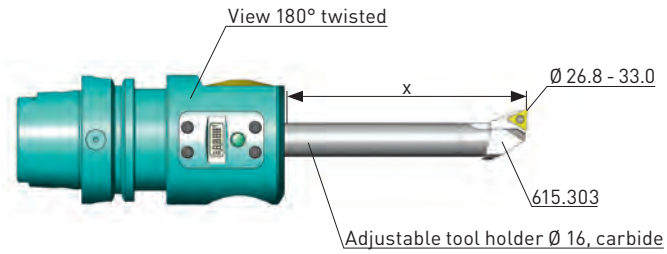


universal

	Workpiece material	Boring depth	universal Ø 25.8 - 30.8 / 32.8 mm							optimized Ø 26.8 - 33.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	40	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.25
		60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	250	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	220	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	40	655.380	0.4	200	0.2	2.0	0.10	0.18	655.303A	0.8	350	0.2	2.0	0.14	0.25
		60	655.380	0.4	200	0.2	1.8	0.10	0.18	655.303A	0.8	350	0.2	1.8	0.14	0.22
		80	655.380	0.4	200	0.2	1.5	0.10	0.14	655.390	0.8	300	0.2	1.5	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.291 and 615.284 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



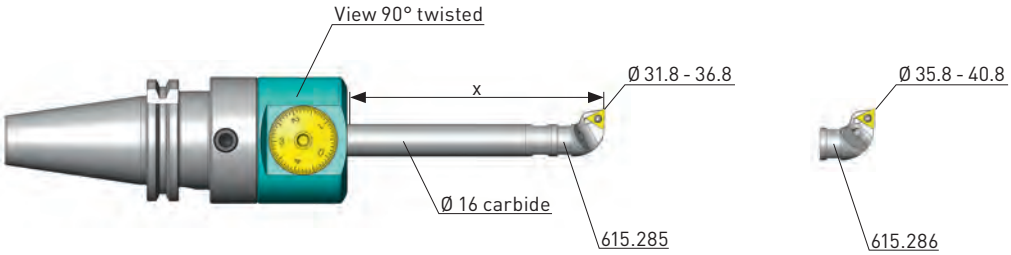
optimized

Workpiece material		Boring depth	universal Ø 25.8 - 30.8 / 32.8 mm							optimized Ø 26.8 - 33.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	40	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.25
		60	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.22
		80	655.380	0.4	200	0.2	1.2	0.10	0.14	655.390	0.8	300	0.2	1.2	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	40	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	40	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	1100	0.2	1.5	0.14	0.30
		60	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	950	0.2	1.5	0.14	0.30
		80	655.388	0.4	240	0.2	1.2	0.10	0.16	655.397	0.8	650	0.2	1.2	0.14	0.25
		100	655.388	0.4	200	0.2	1.0	0.10	0.14	655.398	0.8	400	0.2	1.0	0.14	0.20
		120	655.378	0.2	180	0.2	0.8	0.06	0.12	655.388	0.4	250	0.2	0.8	0.10	0.16
		140	655.378	0.2	110	0.2	0.6	0.06	0.10	655.378	0.2	120	0.2	0.6	0.06	0.12
		160	655.378	0.2	30	0.2	0.4	0.06	0.10	655.378	0.2	40	0.2	0.4	0.06	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	40	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		60	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		80	655.318	0.4	240	0.2	1.2	0.10	0.16	655.320	0.8	650	0.2	1.2	0.14	0.25
		100	655.318	0.4	200	0.2	1.0	0.10	0.14	655.318	0.4	400	0.2	1.0	0.10	0.20
		120	655.319	0.2	180	0.2	0.8	0.06	0.12	655.318	0.4	250	0.2	0.8	0.10	0.16
		140	655.319	0.2	110	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.12
		160	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	40	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		60	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		80	655.318	0.4	120	0.2	1.2	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.18
		100	655.318	0.4	100	0.2	1.0	0.10	0.10	655.318	0.4	100	0.2	1.0	0.10	0.14
		120	655.319	0.2	80	0.2	0.8	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.12
		140	655.369	0.1	60	0.1	0.6	0.04	0.08	655.319	0.2	60	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	40	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		60	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		80	655.316	0.2	40	0.1	0.8	0.06	0.12	655.326	0.4	40	0.1	0.8	0.10	0.12
		100	655.316	0.2	30	0.1	0.6	0.06	0.10	655.316	0.2	30	0.1	0.6	0.06	0.10
		120	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	30	0.1	0.4	0.04	0.10
		140	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 33.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

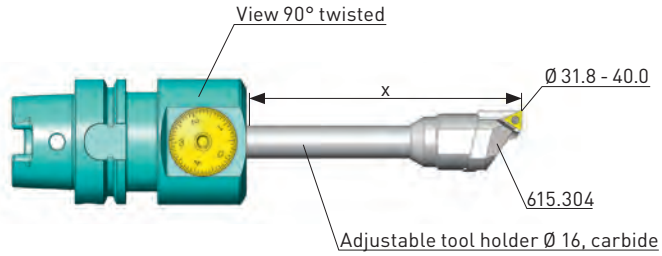


universal

	Workpiece material	Boring depth	universal Ø 31.8 - 36.8 /40.8 mm							optimized Ø 31.8 - 40.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
	< 450 N/mm2	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
	1.0037	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
	1.0401	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
	1.0715	160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel	60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
	450-850 N/mm2	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
	1.0050	100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
	1.0503	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
	1.1141	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
	1.1191	160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	1.5752															
	Steel	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
	850-1200 N/mm2	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
	1.2083	100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
	1.2294	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
	1.2312	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
	1.2344	160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	1.2764															
M	Stainless steels,	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
	ferritic,	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
	martensitic	100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
	1.4016	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
	1.4024	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
	1.4034	160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	1.4762															
	Stainless steels,	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
	austenitic	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	250	0.2	1.2	0.14	0.18
	1.4301	100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	220	0.2	1.0	0.10	0.14
	1.4311	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
	1.4401	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
	1.4435	160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	1.4571															
K	Gray cast iron	60	655.380	0.4	200	0.2	1.8	0.10	0.18	655.303A	0.8	350	0.2	1.8	0.14	0.22
		80	655.380	0.4	200	0.2	1.5	0.10	0.14	655.390	0.8	300	0.2	1.5	0.14	0.20
	GG15	100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
	GG 20	120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
	GG 25	140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
	GG 30	160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.285 and 615.286 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



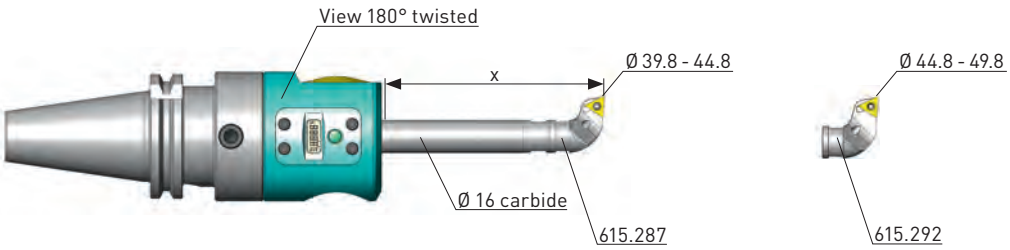
optimized

Workpiece material		Boring depth	universal Ø 31.8 - 36.8 /40.8 mm							optimized Ø 31.8 - 40.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	60	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.22
		80	655.380	0.4	200	0.2	1.2	0.10	0.14	655.390	0.8	300	0.2	1.2	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	60	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	950	0.2	1.5	0.14	0.30
		80	655.388	0.4	240	0.2	1.2	0.10	0.16	655.397	0.8	650	0.2	1.2	0.14	0.25
		100	655.388	0.4	200	0.2	1.0	0.10	0.14	655.398	0.8	400	0.2	1.0	0.14	0.20
		120	655.378	0.2	180	0.2	0.8	0.06	0.12	655.388	0.4	250	0.2	0.8	0.10	0.16
		140	655.378	0.2	110	0.2	0.6	0.06	0.10	655.378	0.2	120	0.2	0.6	0.06	0.12
		160	655.378	0.2	30	0.2	0.4	0.06	0.10	655.378	0.2	40	0.2	0.4	0.06	0.10
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	60	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
		80	655.318	0.4	240	0.2	1.2	0.10	0.16	655.320	0.8	650	0.2	1.2	0.14	0.25
		100	655.318	0.4	200	0.2	1.0	0.10	0.14	655.318	0.4	400	0.2	1.0	0.10	0.20
		120	655.319	0.2	180	0.2	0.8	0.06	0.12	655.318	0.4	250	0.2	0.8	0.10	0.16
		140	655.319	0.2	110	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.12
		160	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	40	0.1	0.4	0.04	0.10
S	Titanium 3.7164	60	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
		80	655.318	0.4	120	0.2	1.2	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.18
		100	655.318	0.4	100	0.2	1.0	0.10	0.10	655.318	0.4	100	0.2	1.0	0.10	0.14
		120	655.319	0.2	80	0.2	0.8	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.12
		140	655.369	0.1	60	0.1	0.6	0.04	0.08	655.319	0.2	60	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Ni-basic-, Co-basic-, Alloys	60	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
		80	655.316	0.2	40	0.1	0.8	0.06	0.12	655.326	0.4	40	0.1	0.8	0.10	0.12
		100	655.316	0.2	30	0.1	0.6	0.06	0.10	655.316	0.2	30	0.1	0.6	0.06	0.10
		120	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	30	0.1	0.4	0.04	0.10
		140	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 40.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

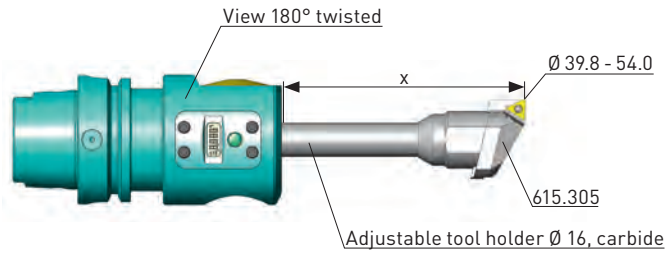


universal

	Workpiece material	Boring depth	universal Ø 39.8 - 44.8 / 49.8 mm							optimized Ø 39.8 - 54.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	60	655.318	0.4	200	0.2	1.5	0.10	0.18	655.334	0.8	450	0.2	1.5	0.14	0.22
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.334	0.8	400	0.2	1.2	0.14	0.20
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.385	0.4	250	0.2	1.0	0.10	0.16
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.385	0.4	160	0.2	0.8	0.10	0.14
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.375	0.2	80	0.2	0.6	0.06	0.12
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.10
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	350	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	280	0.2	1.5	0.14	0.20
		80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	250	0.2	1.2	0.14	0.18
		100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	220	0.2	1.0	0.10	0.14
		120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
		140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
K	Gray cast iron GG15 GG 20 GG 25 GG 30	60	655.380	0.4	200	0.2	1.8	0.10	0.18	655.303A	0.8	350	0.2	1.8	0.14	0.22
		80	655.380	0.4	200	0.2	1.5	0.10	0.14	655.390	0.8	300	0.2	1.5	0.14	0.20
		100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
		120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

The insert holders 615.287 and 615.292 can be srewed on the same tool holder, but cover different boring ranges. The cutting data remain the same for both insert holders.



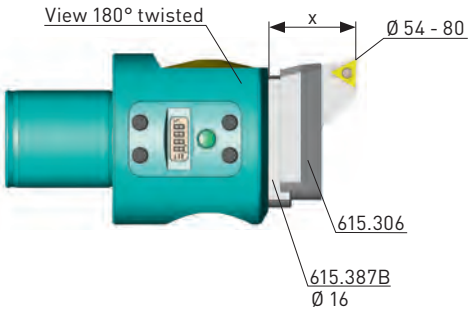
optimized

Workpiece material		Boring depth	universal Ø 39.8 - 44.8 / 49.8 mm							optimized Ø 39.8 - 54.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U		Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	60	655.380	0.4	200	0.2	1.5	0.10	0.18	655.303A	0.8	350	0.2	1.5	0.14	0.22
	< 500 N/mm2	80	655.380	0.4	200	0.2	1.2	0.10	0.14	655.390	0.8	300	0.2	1.2	0.14	0.20
	GGG 40	100	655.380	0.4	170	0.2	1.0	0.10	0.10	655.380	0.4	250	0.2	1.0	0.10	0.16
	GGG 50	120	655.373	0.2	130	0.2	0.8	0.06	0.10	655.380	0.4	160	0.2	0.8	0.10	0.14
		140	655.373	0.2	80	0.2	0.6	0.06	0.08	655.370	0.2	80	0.2	0.6	0.06	0.12
		160	655.363	0.1	25	0.1	0.4	0.04	0.08	655.363	0.1	30	0.1	0.4	0.04	0.10
	GGG	60	655.318	0.4	200	0.2	1.5	0.10	0.16	655.320	0.8	320	0.2	1.5	0.14	0.20
	< 800 N/mm2	80	655.318	0.4	200	0.2	1.2	0.10	0.14	655.320	0.8	300	0.2	1.2	0.14	0.18
	GGG 60	100	655.318	0.4	170	0.2	1.0	0.10	0.10	655.318	0.4	250	0.2	1.0	0.10	0.14
	GGG 70	120	655.319	0.2	130	0.2	0.8	0.06	0.10	655.318	0.4	160	0.2	0.8	0.10	0.12
	GGG 80	140	655.319	0.2	80	0.2	0.6	0.06	0.08	655.319	0.2	80	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
N	Aluminium	60	655.388	0.4	240	0.2	1.5	0.10	0.20	655.397	0.8	950	0.2	1.5	0.14	0.30
	Wrought alloys	80	655.388	0.4	240	0.2	1.2	0.10	0.16	655.397	0.8	650	0.2	1.2	0.14	0.25
	Si < 10%	100	655.388	0.4	200	0.2	1.0	0.10	0.14	655.398	0.8	400	0.2	1.0	0.14	0.20
	3.1354	120	655.378	0.2	180	0.2	0.8	0.06	0.12	655.388	0.4	250	0.2	0.8	0.10	0.16
	3.2315	140	655.378	0.2	110	0.2	0.6	0.06	0.10	655.378	0.2	120	0.2	0.6	0.06	0.12
	3.3545	160	655.378	0.2	30	0.2	0.4	0.06	0.10	655.378	0.2	40	0.2	0.4	0.06	0.10
	3.4365															
	Aluminium	60	655.318	0.4	240	0.2	1.5	0.10	0.20	655.320	0.8	650	0.2	1.5	0.14	0.30
	Cast alloys	80	655.318	0.4	240	0.2	1.2	0.10	0.16	655.320	0.8	650	0.2	1.2	0.14	0.25
	Si > 10%	100	655.318	0.4	200	0.2	1.0	0.10	0.14	655.318	0.4	400	0.2	1.0	0.10	0.20
	G-AlSi 12	120	655.319	0.2	180	0.2	0.8	0.06	0.12	655.318	0.4	250	0.2	0.8	0.10	0.16
	G-AlSi17Cu4Mg	140	655.319	0.2	110	0.2	0.6	0.06	0.10	655.319	0.2	120	0.2	0.6	0.06	0.12
		160	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	40	0.1	0.4	0.04	0.10
S		60	655.318	0.4	120	0.2	1.5	0.10	0.18	655.320	0.8	120	0.2	1.5	0.14	0.20
	Titanium	80	655.318	0.4	120	0.2	1.2	0.10	0.14	655.318	0.4	120	0.2	1.2	0.10	0.18
	3.7164	100	655.318	0.4	100	0.2	1.0	0.10	0.10	655.318	0.4	100	0.2	1.0	0.10	0.14
		120	655.319	0.2	80	0.2	0.8	0.06	0.10	655.319	0.2	80	0.2	0.8	0.06	0.12
		140	655.369	0.1	60	0.1	0.6	0.04	0.08	655.319	0.2	60	0.2	0.6	0.06	0.10
		160	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	30	0.1	0.4	0.04	0.08
		60	655.326	0.4	50	0.1	1.0	0.10	0.16	655.326	0.4	50	0.1	1.0	0.10	0.16
	Ni-basic-,	80	655.316	0.2	40	0.1	0.8	0.06	0.12	655.326	0.4	40	0.1	0.8	0.10	0.12
	Co-basic-,	100	655.316	0.2	30	0.1	0.6	0.06	0.10	655.316	0.2	30	0.1	0.6	0.06	0.10
	Alloys	120	655.369	0.1	30	0.1	0.4	0.04	0.10	655.369	0.1	30	0.1	0.4	0.04	0.10
		140	655.369	0.1	25	0.1	0.4	0.04	0.08	655.369	0.1	25	0.1	0.4	0.04	0.08

When applying the optimized cutting data:

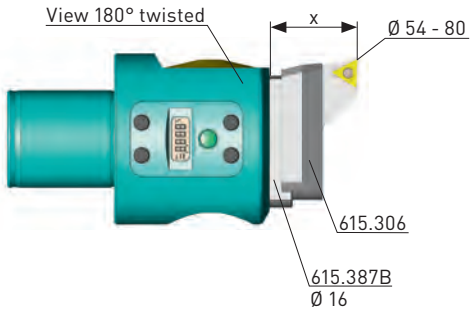
The boring operation has to be done with an adjustable tool holder, clamped in centre position.

- the boring diameter of 54.0 mm may not be exceeded
- the use of a fine balanced tool shank or of an integral type of fine boring head is required

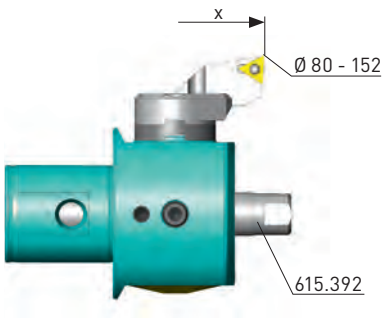


	Workpiece material	Boring depth	universal Ø 54.0-80.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	< 450 N/mm2	40	655.318	0.4	180	0.2	0.6	0.10	0.14
		50	655.318	0.4	160	0.2	0.4	0.10	0.10
	1.0037	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	1.0401								
	1.0715								
P	Steel	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	450-850 N/mm2	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	1.0050	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	1.0503	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	1.1141								
	1.1191								
	1.5752								
P	Steel	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	850-1200 N/mm2	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	1.2083	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	1.2294	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	1.2312								
	1.2344								
	1.2764								
M	Stainless steels,	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	ferritic,	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	martensitic	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	1.4016	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	1.4024								
	1.4034								
M	1.4762								
M	Stainless steels,	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	austenitic	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	1.4301	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	1.4311	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	1.4401								
	1.4435								
	1.4571								
K	Gray cast iron	30	655.380	0.4	200	0.2	1.8	0.10	0.18
		40	655.380	0.4	200	0.2	1.5	0.10	0.14
	GG15	50	655.373	0.2	170	0.2	1.0	0.10	0.10
K	GG 20	60	655.373	0.2	130	0.2	0.8	0.06	0.10
	GG 25								
	GG 30								

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.



	Workpiece material	Boring depth	universal Ø 54.0-80.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG	30	655.380	0.4	200	0.2	1.8	0.10	0.18
	< 500 N/mm2	40	655.380	0.4	200	0.2	1.5	0.10	0.14
	GGG 40	50	655.373	0.2	170	0.2	1.0	0.10	0.10
	GGG 50	60	655.373	0.2	130	0.2	0.8	0.06	0.10
	GGG	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	< 800 N/mm2	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	GGG 60	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	GGG 70	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	GGG 80								
N	Aluminium	30	655.388	0.4	240	0.2	1.5	0.10	0.20
	Wrought alloys	40	655.388	0.4	240	0.2	1.2	0.10	0.16
	Si < 10%	50	655.378	0.2	200	0.2	1.0	0.10	0.14
	3.1354	60	655.378	0.2	180	0.2	0.8	0.06	0.12
	3.2315								
	3.3545								
	3.4365								
	Aluminium	30	655.318	0.4	200	0.2	0.8	0.10	0.18
	Cast alloys	40	655.318	0.4	180	0.2	0.6	0.10	0.14
	Si > 10%	50	655.318	0.4	160	0.2	0.4	0.10	0.10
	G-AlSi 12	60	655.319	0.2	140	0.2	0.4	0.06	0.08
	G-AlSi17Cu4Mg								
S	Titanium	30	655.318	0.4	120	0.2	0.8	0.10	0.18
	3.7164	40	655.318	0.4	100	0.2	0.6	0.10	0.14
		50	655.318	0.4	80	0.2	0.4	0.10	0.10
		60	655.319	0.2	60	0.2	0.4	0.06	0.08
	Ni-basic-,	30	655.318	0.4	50	0.2	0.8	0.10	0.18
	Co-basic-,	40	655.318	0.4	40	0.2	0.6	0.10	0.14
	Alloys	50	655.318	0.4	40	0.2	0.4	0.10	0.10
		60	655.319	0.2	30	0.2	0.4	0.06	0.08

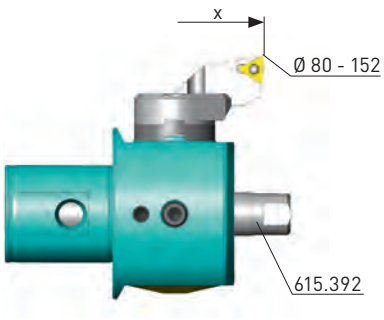


	Workpiece material	Boring depth	universal Ø 80.0-152.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
P	Steel < 450 N/mm2 1.0037 1.0401 1.0715	80	655.334	0.8	450	0.2	2.5	0.14	0.25
		115	655.334	0.8	380	0.2	2.5	0.14	0.25
		145	655.324	0.4	250	0.2	2.5	0.10	0.20
		175	655.324	0.4	150	0.2	2.0	0.10	0.20
		205	655.375	0.2	110	0.2	1.5	0.06	0.15
		220	655.375	0.2	80	0.1	1.0	0.06	0.15
		310	655.375	0.2	100	0.2	1.0	0.06	0.15
	Steel 450-850 N/mm2 1.0050 1.0503 1.1141 1.1191 1.5752	80	655.334	0.8	450	0.2	2.5	0.14	0.25
		115	655.334	0.8	380	0.2	2.5	0.14	0.25
		145	655.324	0.4	250	0.2	2.5	0.10	0.20
		175	655.324	0.4	150	0.2	2.0	0.10	0.20
		205	655.375	0.2	110	0.2	1.5	0.06	0.15
		220	655.375	0.2	80	0.1	1.0	0.06	0.15
		310	655.375	0.2	100	0.2	1.0	0.06	0.15
	Steel 850-1200 N/mm2 1.2083 1.2294 1.2312 1.2344 1.2764	80	655.320	0.8	350	0.2	2.0	0.14	0.25
		115	655.320	0.8	300	0.2	2.0	0.14	0.25
		145	655.318	0.4	240	0.2	2.0	0.10	0.20
		175	655.318	0.4	140	0.2	1.3	0.10	0.20
		205	655.319	0.2	100	0.2	1.3	0.06	0.15
		220	655.319	0.2	70	0.1	0.8	0.06	0.15
		310	655.319	0.2	100	0.2	0.8	0.06	0.15
M	Stainless steels, ferritic, martensitic 1.4016 1.4024 1.4034 1.4762	80	655.320	0.8	350	0.2	2.0	0.14	0.25
		115	655.320	0.8	300	0.2	2.0	0.14	0.25
		145	655.318	0.4	240	0.2	2.0	0.10	0.20
		175	655.318	0.4	140	0.2	1.3	0.10	0.20
		205	655.319	0.2	100	0.2	1.3	0.06	0.15
		220	655.319	0.2	70	0.1	0.8	0.06	0.15
		310	655.319	0.2	100	0.2	0.8	0.06	0.15
	Stainless steels, austenitic 1.4301 1.4311 1.4401 1.4435 1.4571	80	655.320	0.8	300	0.2	2.0	0.14	0.25
		115	655.320	0.8	280	0.2	2.0	0.14	0.25
		145	655.318	0.4	220	0.2	2.0	0.10	0.20
		175	655.318	0.4	140	0.2	1.3	0.10	0.20
		205	655.319	0.2	100	0.2	1.3	0.06	0.15
		220	655.319	0.2	70	0.1	0.8	0.06	0.15
		310	655.319	0.2	100	0.2	0.8	0.06	0.15
K	Gray cast iron GG15 GG 20 GG 25 GG 30	80	655.303A	0.8	350	0.2	2.5	0.14	0.25
		115	655.303A	0.8	350	0.2	2.5	0.14	0.25
		145	655.303A	0.8	240	0.2	2.5	0.10	0.20
		175	655.302A	0.4	150	0.2	2.0	0.10	0.20
		205	655.302A	0.4	100	0.2	1.5	0.10	0.20
		220	655.301A	0.2	70	0.1	1.0	0.06	0.15
		310	655.301A	0.2	100	0.2	1.0	0.06	0.15

Caution:
The given cutting data are guide values. In any case, they have to be adapted to the actual working conditions.

Use tool holder 615.226 with the coolant nozzle 615.392 when using a peripheral insert holder.

Spacer 626.907 is required for certain diameters within the standard range.



	Workpiece material	Boring depth	universal Ø 80.0-152.0 mm						
			Inserts		Vc	Allow. mm/Ø		Feed mm/U	
		X [mm]	Order No.	R	m/min	Std. val.	Max.	Ra 1.6	Max.
K	GGG < 500 N/mm2 GGG 40 GGG 50	80	655.390	0.8	350	0.2	2.5	0.14	0.25
		115	655.390	0.8	350	0.2	2.5	0.14	0.25
		145	655.380	0.4	240	0.2	2.5	0.10	0.20
		175	655.380	0.4	150	0.2	2.0	0.10	0.20
		205	655.370	0.2	100	0.2	1.5	0.06	0.15
		220	655.370	0.2	70	0.1	1.0	0.06	0.15
		310	655.370	0.2	100	0.2	1.0	0.06	0.15
	GGG < 800 N/mm2 GGG 60 GGG 70 GGG 80	80	655.320	0.8	320	0.2	2.0	0.14	0.25
		115	655.320	0.8	300	0.2	2.0	0.14	0.25
		145	655.318	0.4	240	0.2	2.0	0.10	0.20
		175	655.318	0.4	140	0.2	1.3	0.10	0.20
		205	655.319	0.2	100	0.2	1.3	0.06	0.15
		220	655.319	0.2	70	0.1	0.8	0.06	0.15
		310	655.319	0.2	100	0.2	0.8	0.06	0.15
N	Aluminium Wrought alloys Si < 10% 3.1354 3.2315 3.3545 3.4365	80	655.398	0.8	600	0.2	2.5	0.14	0.25
		115	655.398	0.8	500	0.2	2.5	0.14	0.25
		145	655.398	0.8	400	0.2	2.5	0.14	0.20
		175	655.388	0.4	250	0.2	2.5	0.10	0.20
		205	655.388	0.4	170	0.2	2.0	0.10	0.20
		220	655.378	0.2	100	0.2	1.5	0.06	0.15
		310	655.378	0.2	100	0.2	1.5	0.06	0.15
	Aluminium Cast alloys Si > 10% G-AlSi 12 G-AlSi17Cu4Mg	80	655.320	0.8	600	0.2	2.5	0.14	0.25
		115	655.320	0.8	500	0.2	2.5	0.14	0.25
		145	655.320	0.8	400	0.2	2.5	0.14	0.20
		175	655.318	0.4	250	0.2	2.5	0.10	0.20
		205	655.318	0.4	170	0.2	2.0	0.10	0.20
		220	655.319	0.2	100	0.2	1.5	0.06	0.15
		310	655.319	0.2	100	0.2	1.5	0.06	0.15
S	Titanium 3.7164	80	655.320	0.8	120	0.2	2.5	0.14	0.25
		115	655.320	0.8	120	0.2	2.5	0.14	0.25
		145	655.318	0.4	100	0.2	2.5	0.10	0.20
		175	655.318	0.4	80	0.2	2.0	0.10	0.20
		205	655.318	0.4	70	0.2	1.5	0.10	0.20
		220	655.319	0.2	60	0.1	1.0	0.06	0.15
		310	655.319	0.2	60	0.1	1.0	0.06	0.15
	Ni-basic-, Co-basic-, Alloys	80	655.326	0.4	50	0.2	1.0	0.10	0.20
		115	655.326	0.4	50	0.2	1.0	0.10	0.20
		145	655.326	0.4	40	0.2	1.0	0.10	0.20
		175	655.316	0.2	30	0.1	0.8	0.06	0.15
		205	655.316	0.2	30	0.1	0.8	0.06	0.15
		220	655.316	0.2	30	0.1	0.6	0.06	0.15
		310	655.316	0.2	30	0.1	0.6	0.06	0.15

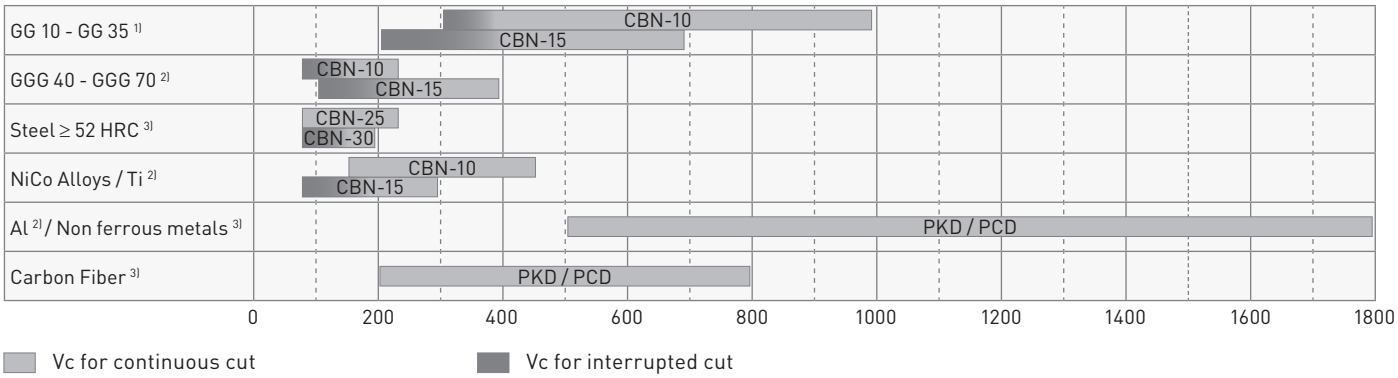
Application advice

Polycrystalline cubic boron nitride CBN
CBN cutting materials are substantially harder than sintered carbide and exceptionally heat-resistant. Depending on the design (with or without land on the cutting edge) they are specially suitable for boring hardened steel types (52-65 HRC), hard cast steel, cast iron and hard nickel alloys.

Polycrystalline diamond PCD
PCD cutting edges are extremely hard and abrasion-resistant. They permit the high-speed finish-machining of non-ferrous and nonmetallic materials.

Workpiece / Cutting speed

Workpiece material / Cutting speed Vc (m/min)

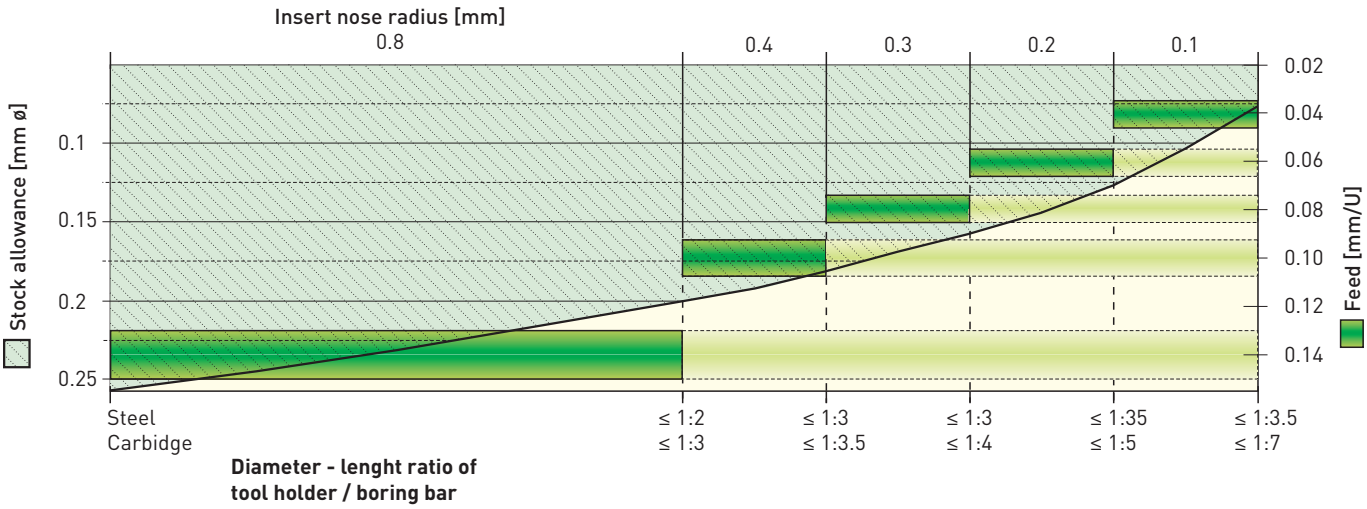


Coolant
1) Dry- or wet boring possible
2) Wet boring recommended
3) Dry boring recommended

Cutting aluminium with PCD
In most cases the max cutting speed is not determined by the relation of cutting material / workpiece material but by restrictions of the rotating speed, the tool length or the chip control.

Feed / Stock allowance

Feed [mm/rev] and stock allowance in relation to the insert nose radius and the diameter - length ratio of the tool.
Limiting values depend on the machine tool and have to be determined by tests.



The complete product overview and accessories can be found in the BIG KAISER main catalog.

A Member of the BIG DAISHOWA Group

BIG KAISER Precision Tooling Ltd.
Glattalstrasse 516 | CH-8153 Rümlang | T: +41 44 817 92 00 | F: +41 44 817 92 01 | info@ch.bigkaiser.com | www.bigkaiser.com